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ABSTRACT

This book, in conjunction with the student activities books for macroeconomics and microeconomics, is designed for teaching the Advanced Placement Economics course. The book contains five units for the microeconomic portion and six units for the macroeconomic portion of the text. Along with the many activities are sample multiple-choice questions, sample short essay questions, and sample long essay questions. The units for the microeconomic section are entitled: (1) "The Basic Economic Problem" (5 lessons); (2) "The Nature and Functions of Markets" (7 lessons); (3) "The Theory of the Firm" (8 lessons); (4) "Factor Markets" (5 lessons); and (5) "The Role of Government" (5 lessons). The units for the macroeconomic section are entitled: (1) "Basic Economic Concepts" (2 lessons); (2) "Measuring Economic Performance" (6 lessons); (3) "Aggregate Demand and Aggregate Supply: Fluctuations of Outputs and Prices" (5 lessons); (4) "Money, Monetary Policy, and Economic Stability" (4 lessons); (5) "Monetary and Fiscal Combinations: Economic Policy in the Real World" (4 lessons); and (6) "The United States in a Global Economy" (5 lessons). (EH)

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ADVANCED PLACEMENT ECONOMICS

TEACHER RESOURCE MANUAL

John S. Morton

ED 424 132

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Economics America
Economic Education

ADVANCED PLACEMENT ECONOMICS

TEACHER RESOURCE MANUAL

John S. Morton

OVER 45 YEARS
National Council on Economic Education
SINCE 1949

EconomicsAmerica
National Council on
Economic Education
A partnership of education,
business, and labor

Author

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Foreword

The National Council's ***Advanced Placement Economics*** program, the second edition of APIP, is the only instructional package available for teaching complete college-level economics to high school students. The original APIP was specifically designed, as is the new edition, to assist high school teachers in teaching undergraduate principles of economics to high school students as part of the Advanced Placement (AP) Program of the College Board. This revised, up-to-date program is keyed to the College Board's recommended course syllabus, meets every syllabus requirement, and prepares students for all Advanced Placement Economics tests. All lessons and activities incorporate methods that focus learning on student activity rather than teacher lecture.

The new edition features:

- 30 new microeconomic activities
- 35 new macroeconomic activities
- new lessons reflecting the latest changes in the AP Economics Examinations
- over 250 sample multiple-choice questions in the five-option AP format
- over 100 sample essay questions in the new long and short AP format

Students who complete the micro- and macroeconomics courses in the AP Program and who pass a nationally standardized examination developed by economists earn placement in advanced economics courses during their first year at most colleges and universities in the country. Since ***Advanced Placement Economics*** teaches the undergraduate principles sequence, it also contributes to the effectiveness of economics instructors at two-year colleges, four-year colleges, and everywhere else that a top quality principles course is offered.

From the first discussions by representatives of the Committee on Economic Education of the American Economics Association with the College Entrance Examination Board (sponsor of Advanced Placement Programs) to the final approval of the original program in 1985, the National Council has worked intimately with the College Board to ensure that the program was closely correlated with the AP economics program. Many individuals have contributed to the program as advisers, writers, and reviewers. They are listed elsewhere in this front matter.

The National Council thanks John Morton who served as principal writer for both the original version and this edition. In addition, we thank Phillip Saunders who contributed many activities from his microeconomics and macroeconomics student workbooks. The National Science Foundation funded the summer institutes on AP Economics, and many of the lessons included in this edition of this highly successful program were developed by teachers who attended the summer institutes.

Joan Sullivan Baranski
Publisher

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National Review Committee

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National Science Foundation-National Council on Economic Education Workshop Participants/Readers

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Introduction

Advanced Placement Economics

Advanced Placement Economics is designed to teach the Advanced Placement Economics course and to prepare your students for the AP Economics Examinations.

The AP Program offers two separate examinations in economics: one in microeconomics and one in macroeconomics. Each AP examination is intended for qualified students who wish to complete studies in a secondary school equivalent to a one-semester college introductory course. Each examination presumes the student has pursued at least one semester of college-level preparation.

The AP Examination in Microeconomics and the AP Examination in Macroeconomics are each approximately two hours long. Each examination consists of a 70-minute multiple-choice section and a 50-minute free-response section. In each examination the multiple-choice section accounts for two-thirds of the student's examination grade and the free-response section for the remaining one-third.

Using *Advanced Placement Economics*

The heart of ***Advanced Placement Economics*** consists of the microeconomics and macroeconomics Student Activities Books and the Teacher Resource Manual. Each unit in the Student Activities Books begins with a "Key Ideas" section, which provides structure. The Student Activities teach basic economic principles and allow students to apply economic concepts to a variety of situations. The AP Economics Tests contain many complex application questions, and students who only memorize economic principles will do poorly on them. Each unit ends with sample multiple-choice and essay questions. You could use these as a test, but they are better used as a review exercise. They are written in the same format as the questions on the AP Tests.

The Teacher Resource Manual provides form and structure to your course. In addition to microeconomics and macroeconoics course outlines, it contains unit overviews, unit and daily lesson plans, planning suggestions, lesson objectives, answers to the Student Activities, and Visuals. The Teacher Resource Manual is not designed as a cookbook. Teachers of an AP Program should design their own curriculum; ***Advanced Placement Economics*** materials will make that process easier.

The New and Improved *Advanced Placement Economics*

The new state-of-the-art Advanced Placement program has been revised, updated, and polished. We modestly believe that it is now the best supplementary package published for use in an AP or college principles-of-economics course. Veteran AP teachers will find that 48 percent of the Activities are new and almost every Activity has been revised and improved. New teachers will find that ***Advanced Placement Economics*** adds structure to the AP course. These are some of the improvements:

1. The first edition of this program was reviewed by 100 AP teachers who attended AP workshops cosponsored by the National Council on Economic Education and the National Science Foundation at Clemson University, Purdue University, UCLA, and the University of Minnesota. The participants corrected errors in content and pedagogy and suggested many improvements for the second edition.

2. The workshop participants also wrote new Activities, many of which appear in the second edition. There are 30 new microeconomics Activities and 36 new macroeconomics Activities. Overall, 48 percent of the Activities are new, and most of them were developed by experienced AP and college teachers.

3. All test items in the second edition have the same design as the AP Economics Examinations. The multiple-choice questions have five options, and the essays are divided into the short and long essay question formats now used on the AP Economics Tests.

4. The lessons feature a greater variety of teaching techniques than the first edition. More lessons utilize cooperative learning and emphasize different learning styles. The changes will not be noticed in the Student Activities Books but will be apparent in the Teacher Resource Manual.

5. The content was revised to reflect changes in the AP Examinations and to address weaknesses that the College Board's AP Economics Development Committee had found when analyzing the answers on past AP Exams. These weaknesses will be discussed later. The most important change is that beginning in 1996, students may be required to draw appropriate graphs or diagrams to illustrate and/or explain an answer to a free-response question. There are several additional Activities utilizing graphs in this edition of ***Advanced Placement Economics***.

6. Each unit now has Visuals which provide structure to lessons and make it easier for the teacher to explain important economic concepts.

Veteran AP Teacher Alert: Changes and Concerns about the AP Economics Tests

The new edition of ***Advanced Placement Economics*** addresses changes and concerns of the College Board's AP Economics Development Committee. The committee plans to implement changes in the free-response sections of the Microeconomics and Macroeconomics Examinations. Questions requiring examinees to draw appropriate graphs or diagrams to illustrate and/or explain an answer to a free-response question may appear beginning with the 1996 exams.

The committee has also raised general concerns regarding coverage and understanding of some economic terms and concepts that AP examinees perennially have found difficult to answer. Some of the problematic items the committee has identified are:

1. Monopoly model—In general, examinees could neither identify the profit-maximizing price and output level nor explain why marginal revenue is less than price in a monopoly.

2. Money multiplier—Examinees have difficulty explaining what the money multiplier is and how it works.

3. Public goods—A proper and complete definition of public goods includes the two basic characteristics: nonrivalry and nonexcludability in consumption. It appears that only the nonexcludability characteristic has been covered with little or no coverage of nonrivalry. The problem stems from differences in textbooks, coverage, and discussion of public goods.

4. Comparative advantage—Examinees find it difficult to solve comparative advantage problems when the problems are formulated using labor hours rather than actual units of output. Again the problem stems from the approaches different textbooks employ and from the fact that students in general have been taught to solve comparative advantage problems using actual units only. They should be taught both ways.

5. Economic growth—Examinees have trouble answering questions on economic growth. They should learn and understand how economic growth occurs.

Publications from the College Board

Several publications from the College Board are essential for the AP teacher:

- *The Advanced Placement Course Description in Economics* ("Acorn Book") provides a detailed outline of the microeconomics and macroeconomics examinations as well as a few sample multiple-choice and free-response questions.
- New teacher's guides (1994) for AP Microeconomics and Macroeconomics contain syllabi from high school and college teachers as well as a listing of resource materials including textbooks. The entire 1995 AP Economics Examinations will be published and available prior to the administration of the 1996 examination. The 1990 Examinations have also been released.

You can order these materials from any College Board regional office or the national office for a small fee. A list of these offices follows:

College Board Regional Offices

Middle States
John Diamond
Suite 410, 3440 Market Street
Philadelphia, Pennsylvania 19104-3338
215-387-7600

Midwest
Robert McDonough
Suite 401, 1800 Sherman Avenue
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Philip Arbolino, Wade Curry, Charlotte Eielson
45 Columbus Avenue
New York, New York 10023-6992
212-713-8058

Choosing a Textbook

Many textbooks for the college principles course are similar. We correlated ***Advanced Placement Economics*** with three of the most widely used texts:

- William J. Baumol and Alan S. Blinder
  Economics: Principles and Policy (6th edition)
  Harcourt Brace and Company
  The Dryden Press
  Fort Worth, Texas 1994
- Campbell R. McConnell and Stanley L. Brue
  Economics (12th edition)
  McGraw-Hill, Inc.
  New York, New York 1993
- Roger LeRoy Miller
  Economics Today (8th edition)
  HarperCollins College Publishers
  New York, New York 1994

The publishers of these textbooks have allowed us to use some of their ancillary materials. Whichever textbook you choose, be sure to ask about ancillary materials including the student activities book, transparencies, teacher's manual, and test bank. Many test banks are on computer disks to make construction of tests easier.

Councils and Centers on Economic Education

Contact your Council or Center on Economic Education for help with your AP course. Every state has a council and usually several college centers. A directory of the councils and centers is available from the National Council on Economic Education (800-338-1192). The centers will be pleased to help you plan an AP Economics course. Center directors not only have access to curriculum materials for the college principles course but also have experience in working with elementary and secondary school teachers.

Advanced Placement Economics

Microeconomics
Teacher Resource Manual

Outline for an Advanced Placement Microeconomics Course

Unit 1. The Basic Economic Problem: 13 days

- A. Methodological issues in economics
  - 1. Positive and normative economics
  - 2. Microeconomics and macroeconomics
  - 3. Using mathematical and graphical methods to analyze an economic issue
- B. Scarcity: the nature of economic systems
- C. Production possibilities and opportunity costs
- D. Specialization, comparative advantage, and exchange
- E. The functions of an economic system (what, how, and for whom) with applications to alternative economic systems
  - 1. Tradition
  - 2. Command
  - 3. Market
- F. An economic way of thinking

Unit 2. The Nature and Functions of Markets: 18 days

- A. Demand
  - 1. Relationship between price and quantity demanded
  - 2. Determinants of demand
  - 3. Changes in quantity demanded vs. change in demand
  - 4. Introduction to elasticity of demand
- B. Supply
  - 1. Relationship between price and quantity supplied
  - 2. Determinants of supply
  - 3. Changes in quantity supplied vs. change in supply
  - 4. Introduction to elasticity of supply
- C. Equilibrium
  - 1. Why price and quantity move toward equilibrium
  - 2. Shifts in supply and demand
  - 3. Surpluses and shortages
  - 4. Real-world applications of supply and demand
- D. Markets as coordinators
  - 1. Information function
  - 2. Incentive function
  - 3. Rationing function
- E. Elasticity of supply and demand
  - 1. Demand
    - a. Total revenue method
    - b. Coefficient method
    - c. Determinants of elasticity of demand
    - d. Applications of elasticity of demand
  - 2. Supply
    - a. Time periods
    - b. Applications

Unit 3. The Theory of the Firm: 25 days

- A. Consumer choice and individual consumer demand
  - 1. Introduction to consumer behavior
  - 2. Marginal utility analysis
  - 3. Derivation of individual demand curves
  - 4. Derivation of market demand curves
- B. Firm production and costs
  - 1. Introduction to firm behavior
  - 2. Marginal profit analysis
  - 3. Average and marginal costs
  - 4. Average and marginal revenues
- C. Product pricing and outputs, both individual firm and market
  - 1. Perfect competition and derivation of supply
  - 2. Monopoly
  - 3. Other forms of imperfect competition
    - a. Oligopoly
    - b. Monopolistic competition
- D. Efficiency and government policy toward imperfect competition

Unit 4. Factor Markets: 13 days

- A. Marginal productivity and factor demand
  - 1. Resource demand as derived demand
  - 2. Marginal revenue product
  - 3. Rule for employing resources MRP = MRC
  - 4. Changes in resource demand
- B. Determination of wages
  - 1. Perfect factor markets
  - 2. Imperfect factor markets
- C. Determination of rent, interest, and profit

Unit 5. The Role of Government: 12 days

- A. Public choice analysis
- B. Government and the allocation of resources
  - 1. Externalities
  - 2. Public goods
- C. Government and redistribution of income
  - 1. Overview—distribution of income
  - 2. The effects of taxation on the distribution of income (tax incidence)
    - a. Progressive taxes
    - b. Regressive taxes
    - c. Proportional taxes
- 3. The effects of government expenditures on the distribution of income (expenditure incidence)

Microeconomics

Unit 1

The Basic Economic Problem

13 Days

Unit Overview

Unit 1 focuses on scarcity; it also examines some methodological questions in economics. The unit covers concepts such as scarce resources, unlimited wants, tradeoffs in decision making, absolute advantage, and comparative advantage. It analyzes the economic systems (market, tradition, command) that have been used to answer the questions of what, how, and for whom to produce. Finally, the unit introduces students to an economic way of thinking. This idea is driven home by the opening and closing Activities. About eight to twelve percent of the microeconomics AP test will be about Unit 1 concepts.

Textbook Assignments

Baumol and Blinder, Chapters 1, 3, 39

McConnell, Chapters 1, 2, 3

Miller, Chapters 1, 2, 6

Planning Ahead

You may administer a pretest during the first unit so that you can set up some benchmarks against which to measure students' progress. The Test of Economic Literacy measures your students' progress against a nationally normed sample of high school students. The test covers both microeconomics and macroeconomics. The Revised Test of Understanding in College Economics measures your students' progress against a sample of college students. Use the micro version.

Activity 11 is the first in a series of essays students will be asked to write. These essay questions will help them prepare for the essays on the AP test. They require students to apply economic principles to a wide variety of conventional and unconventional situations. We recommend that you give the assignment a few days before the answers are due to give students ample time to write well-reasoned responses.

Unit 1 Activities

Activity 1	Do You Think Like an Economist?
Activity 2	Scarcity, Opportunity Cost, and Production Possibilities Curves
Activity 3	Scarcity, Opportunity Cost, Values, and Choice
Activity 4	The Cost of College Education
Activity 5	Types of Economic Systems
Activity 6	Broad Social Goals of a Society
Activity 7	Campus Parking
Activity 8	Why Communism Failed
Activity 9	The Hatfields and the McCoys
Activity 10	Anything Worth Doing Is Not Necessarily Worth Doing Well
Activity 11	Thinking in an Economic Way

Unit 1 Visuals

Visual 1.1	The Economic Way of Thinking
Visual 1.2	Production Possibilities Curve

Sample Unit 1 Plan

Week 1	Week 2	Week 3
Give pretest: Test of Understanding College Economics (Micro TUCE).	1. Go over Activity 4. 2. Assign Baumol, Chap. 39; McConnell, Chap. 3; Miller, Chap. 6.	1. Discuss Activity 10 and Activity 11. 2. Assign Sample Multiple-Choice and Essay Questions.
1. Give lecture on economic way of thinking. 2. Have students complete Activity 1. 3. Discuss Activity 1. 4. Assign Baumol, Chap. 1; McConnell, Chap. 1; Miller, Chap. 1.	1. Have students read and discuss Activity 5. 2. Do market, command, and tradition simulation.	Review: Go over sample questions.
1. Discuss the economic way of thinking in more detail. 2. Discuss methodology of economics: micro vs. macro, normative vs. positive, graphing. 3. Assign Baumol, Chap. 3; McConnell, Chap. 2; Miller, Chap. 2.	1. Have students read Activity 6 and do goals simulation. 2. Assign Activity 7 and Activity 8.	Unit Test.
1. Give lecture on scarcity, opportunity cost, and production possibilities curves. 2. Assign Activity 2 and Activity 3.	1. Discuss Activity 7 and Activity 8. 2. Lecture on comparative and absolute advantage, specialization, and trade. 3. Work through Activity 9.	
1. Discuss Activity 2 and Activity 3. 2. Assign Activity 4.	1. Complete Activity 9. 2. Discuss marginalism. 3. Assign Activity 10 and Activity 11.	

UNIT 1, LESSON 1

The Economic Way of Thinking

Introduction and Description

This lesson acquaints students with basic economic concepts and methodology. **Advanced Placement Economics** has thousands of details that can confuse students. Students need a framework to organize these details. This lesson begins with some key economic ideas, which represent a new set of lenses through which to view the world. The lesson ends with a test of economic myths that should get the students' attention. This exercise also gives the teacher a way of reinforcing the economic concepts taught at the beginning of the lesson.

Objectives

1. Define *opportunity cost*.
2. Define the "economic way of thinking."
3. Apply scarcity concepts to a variety of economic and noneconomic situations.

Time Required

- Two class periods

Materials

1. Activity 1
2. Visual 1.1

Procedure

1. Project Visual 1.1 and discuss the economic way of thinking. Here are some discussion ideas for each point on the transparency.

    1. **Everything has a cost.**

        This is the basic idea that "there is no such thing as a free lunch," meaning that every action costs someone time, effort, or lost opportunities to do something else. Introduce the term *opportunity cost* here. Stress the concept that people incur costs when making decisions even when they appear to pay nothing.

    2. **People choose for good reasons.**

        People always face choices, and they should choose the alternative that gives them the most advantageous combination of costs and benefits. You might stress here that if people have different values they can make different choices. This might also be a good place to discuss normative vs. positive economics. Economists tend to be a tolerant lot because they realize people choose for good reasons. Also stress that it is people who choose. Much of the Advanced Placement course concerns business and government decision making. But business and government decisions are made by people.

    3. **Incentives matter.**

        This course is really about incentives. It has been said that economics is about incentives and everything else is commentary. Supply-and-demand analysis is about incentives. The theory of the firm and factor markets are about incentives. Government decision making is about incentives. When incentives change, people's behavior changes in predictable ways.

    4. **People create economic systems to influence choices and incentives.**

        Cooperation among people is governed by written and unwritten rules that are the core of an economic system. As rules change, incentives and behavior change. Lesson 3 Microeconomics Unit 1 concerns economic systems. The success of market systems and the failure of communism are rooted in incentives.

    5. **People gain from voluntary trade.**

        People trade when they believe the trade makes them better off. If they expect no benefits, they don't trade. Part of the Advanced Placement course features international trade. However, once again it is people, not countries, who trade. A market system is about trade. Economics is about trade.

LESSON 1 continued

6. **Economic thinking is marginal thinking.**

   Marginal choices involve the effects of additions and subtractions from current conditions. Much of this course is about marginal costs and benefits. Marginal thinking will be stressed in Units 3 and 4, where the theory of the firm and factor markets are discussed. Nevertheless, marginal decision making should be discussed in every unit.

7. **The value of a good or service is affected by people's choices.**

   Goods and services do not have intrinsic value; their value is determined by the preferences of buyers and sellers. Because of this, trading moves goods and services to higher valued uses. This is why trading is so important. The price of a good or service is set by supply and demand.

8. **Economic actions create secondary effects.**

   Good economics involves analyzing secondary effects. For example, rent controls make apartments more affordable to some consumers. Controls also make it less profitable to build and maintain apartments. The secondary effect is a shortage of apartments and houses for rent.

9. **The test of a theory is its ability to predict.**

   Students will discuss dozens of theories in an AP Economics course. All these theories have simplifying assumptions. However, the proof of the pudding is in the eating. If the theory predicts the consequences of actions, it is a good theory. Nothing is "good in theory but bad in practice."

2. Now tell students they are going to take a brief quiz. Give each student a copy of Activity 1. Give them a few minutes to answer the questions.

3. Either poll the students on their answers, or simply announce that all the answers are false. Students will think this is a cheap trick.

4. Discuss the answers and, as you do, explain some of the basic laws of economics. Economics is the study of human behavior, and principles have been developed to explain that behavior.

5. Questions 1-4 concern scarcity. Goods are scarce because we have limited resources and unlimited wants. Therefore, one can't have everything one wants. Whenever a choice is made, something else is sacrificed. The "something else" that we sacrifice is called the opportunity cost. To be scarce, something must be limited and desirable. Scarce goods have prices.

   q.1 Sunshine isn't scarce because it isn't limited; it is a free good.

   q.2 Polio isn't scarce because it isn't desirable.

   q.3 It is true that parents sacrifice goods to provide support for their children, but the statement does not consider all the time parents spend on their children. Time spent with children cannot be spent doing other things. Opportunity costs involve more than the things that money can buy.

   q.4 An important opportunity cost of going to college is lost earnings. If you could earn $20,000 a year by working, you will sacrifice $80,000 over four years of college.

6. Questions 5-6 concern the laws of supply and demand. People tend to buy more of something when the price is lower and less when the price is higher. This price includes money as well as such things as time, aggravation, inconvenience, and moral guilt. Sellers will try to sell more of something if the price is higher and less of it if the price is lower. This conflict is resolved through the market.

   q.5 Question 5 is false because, all other things equal, less mass transportation will be purchased if the price is higher. The price could be raised in dollars, inconvenient schedules, crime, and filthy cars.

The demand curve for transportation would have to be perfectly inelastic or vertical for the answer to this question to be true.

q.6 The price of something depends on supply and demand, not on usefulness. Water is more useful than diamonds, but it has a lower price.

7. Questions 7-8 concern gains from trade. When people trade voluntarily, both parties expect to gain, or they wouldn't trade. One reason for this gain is the law of comparative advantage. If one person does legal work better than another and if a second person types better than the first, they would gain by trade. But would a lawyer who is the fastest typist in town hire a secretary? Yes, because of comparative advantage. Each person would specialize in what he or she does comparatively better. An hour spent typing is an hour not spent in legal work, and the opportunity cost for the lawyer would be very high. The lawyer will specialize in legal work, and the secretary in typing. The total output of goods and services will increase. This concept can also be applied to countries.

8. Questions 9-10 concern businesses and the role of profits.

q.9 A monopoly does charge a higher price than a competitive market price, but the monopolist cannot repeal the law of demand. If the price is too high, the monopolist might sell nothing. A monopolist will try to establish a price at a point that will make the greatest profit. This price is higher than a competitive price and will result in less production.

q.10 Profits are an incentive for business to succeed. A business that doesn't care about its customers will not make high profits. As Adam Smith (1723-1790) said, "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard for their own interest. We address ourselves not to their humanity, but to their self-love, and never talk to them of our own necessities but of their advantages."

9. Be sure the students understand that this is a brief introduction to some of the ideas they will learn in an AP Economics course.

UNIT 1, LESSON 2

Scarcity, Opportunity Cost, and Production Possibilities Curves

Introduction and Description

In this lesson, students learn about scarcity and opportunity cost and use a diagram to illustrate these economic concepts. Start with a lecture on scarcity and production possibilities curves. Then use Activity 2 to reinforce the lecture. Activity 3 reinforces the concept of scarcity and provides a deeper analysis of making choices at the margin. Finally, Activity 4 differentiates between implicit and explicit costs and applies these concepts to a problem to which students can relate.

Objectives

1. Review the definition of *opportunity cost.*
2. Graph and interpret data.
3. Graph and distinguish among *inverse, direct,* and *independent relationships.*
4. Graph and distinguish between *constant* and *variable relationships.*
5. Identify the conditions that give rise to the economic problem of scarcity.
6. Identify the opportunity costs of various courses of action involving a hypothetical problem.
7. Construct production possibilities curves from sets of hypothetical data.
8. Apply the concept of opportunity cost to a production possibilities curve.
9. Analyze the significance of different locations on, above, and below a production possibilities curve.
10. Compare and contrast the effects of societal priorities on the slope, outer limits, and operating points of the production possibilities curve.
11. Apply scarcity concepts to a variety of economic and noneconomic situations.

Time Required

- Three class periods

Materials

1. Activities 2, 3, and 4
2. Visual 1.2

Procedure

1. Give a lecture on scarcity.
   a. Wants are unlimited.
   b. Resources are limited and fall into four categories: land, labor, capital, and entrepreneurship.
   c. There is a need to make decisions. The cost of choosing one good is giving up another. This is called opportunity cost.
2. Use Visual 1.2 of a production possibilities curve (PPC) and make points such as these:
   1. What are the tradeoffs involved?
   2. Why is the PPC concave, or bowed out, from the origin?
   3. What does a point inside the PPC illustrate?
   4. What is a historical example of a point inside the PPC? (the Great Depression of the 1930s)
   5. What is the significance of a point outside the PPC?
   6. Under what conditions can a point outside the PPC be reached?
3. Have the students complete Activity 2 as homework.
4. Go over Activity 2. When discussing the answers consider these points:
   a. The law of increasing opportunity cost is hard for students to grasp. If opportunity cost is constant or increasing for one of the goods, it is constant or increasing, respectively, for both goods.
   b. The free good case is an exercise in graphic interpretation, which can be

LESSON 2 continued

used to emphasize that there are very few free goods in the world.

   c. Decreasing opportunity cost is listed here as a distractor, but no production possibilities curves illustrating this are shown. Such a curve would be convex to the origin, and a society would never operate on the curve because increasing returns over the entire output range would force production to one of the boundary points on the axes.

5. Assign Activity 3 as homework. In addition to scarcity and opportunity cost, this activity uses marginal analysis. Before assigning Activity 3, discuss *marginal analysis* and how it avoids all-or-nothing thinking.

6. Go over Activity 3. Emphasize the following points when going over the answers.

   a. The analysis rests on the usual assumptions of rational or maximizing behavior, known and definite preferences, and scarce resources.

   b. In Part B-q.1 the objective is the highest combined score on both exams. Other preferences could also be illustrated by this problem. The combination that gives the highest combined score is 5 hours to Economics and 4 hours to Mathematics.

   c. In Part B-q.2 the same answer is arrived at by using marginal analysis, allocating the marginal hour to the use that achieves the largest increase in combined scores. The first hour of studying Economics raises total points from 0 to 26, but the first hour of studying Mathematics raises total points by only 24. The best allocation of the first hour is to Economics, and 8 hours remain. To determine the best allocation of the second hour of study time, we can see that the marginal hour in Mathematics is still the first hour (24 points), but for Economics it is the second (22 points). Total points will increase the most if Mathematics is selected with total points increasing to 50. The process continues until the scarce time resource is exhausted.

   d. Parts C and D can be used to illustrate the notion of opportunity cost. They also provide an opportunity to illustrate how marginal analysis can be used to avoid all-or-nothing thinking. It's not so much "Are you for Mathematics (defense) or are you for Economics (social security)?" Rather, it is "*How much* Mathematics (defense) are you willing to trade for *how much* Economics (social security)?"

7. Before assigning Activity 4, discuss the differences between explicit, or accounting costs, and implicit, or indirect costs. Activity 4 should make students aware that the implicit cost of forgone income frequently causes students to realize that they have vastly underestimated the "cost" of a college education. This forgone income is a cost that differs for different students, but it is a factor that should be considered by all. On the other hand, expenses for room and board, which students often count as a cost of their education, should not be counted in full. Students would have room and board expenses of some sort even if they were not in college; therefore only the difference between the cost of room and board at college and the cost of room and board elsewhere should be counted. Also emphasize that the numbers are hypothetical. Finally, the Activity does not consider the benefits of a college education. The costs may be high, but the benefits may be higher.

8. Assign Activity 4 as homework.

9. Go over the answers to Activity 4.

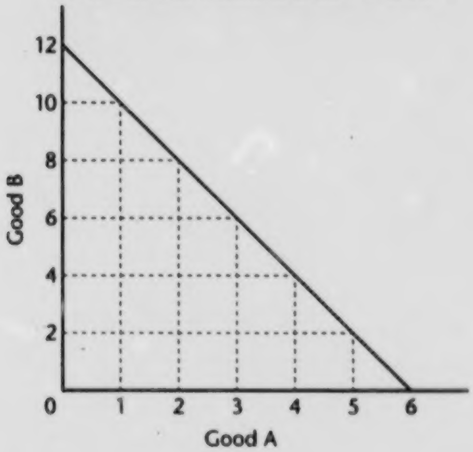
ACTIVITY 2 **ANSWER KEY**
Scarcity, Opportunity Cost, and Production Possibilities Curves

Scarcity necessitates choice. More of one thing means less of something else. The opportunity cost of using scarce resources for one thing instead of something else is often represented in graphical form as a production possibilities curve.

Part A.

Use *Production Possibilities Curves 1-3* to answer questions a, b, c, and d for each curve. Write a number on the answer blank or cross out the incorrect words in parentheses. (Note that *Production Possibilities Curve 3* is not realistic, but it serves to support a "what if" thought exercise.)

Production Possibilities Curve 1



1. If this economy is presently producing 12 units of Good B and 0 units of Good A:

   a. the opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of __2__ unit(s) of Good B. **[12 → 10 = –2]**

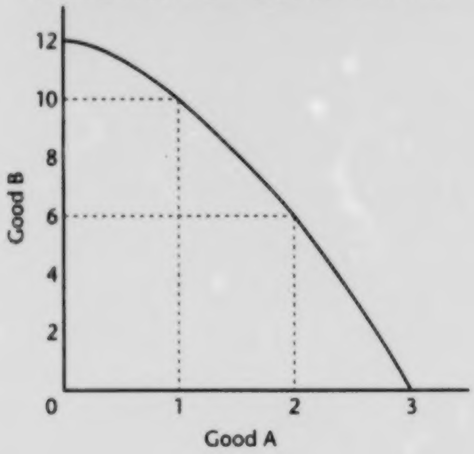
   b. the opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of __2__ unit(s) of Good B. **[10 → 8 = –2]**

   c. the opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of __2__ unit(s) of Good B. **[8 → 6 = –2]**

   d. This is an example of *(constant/~~increasing/decreasing/zero~~)* opportunity cost per unit for Good A.
   In terms of forgone units of Good B, it's always 1A = –2B

ACTIVITY 2 ANSWER KEY continued

Production Possibilities Curve 2



2. If the economy represented in *Production Possibilities Curve 2* is presently producing 12 units of Good B and 0 units of Good A:

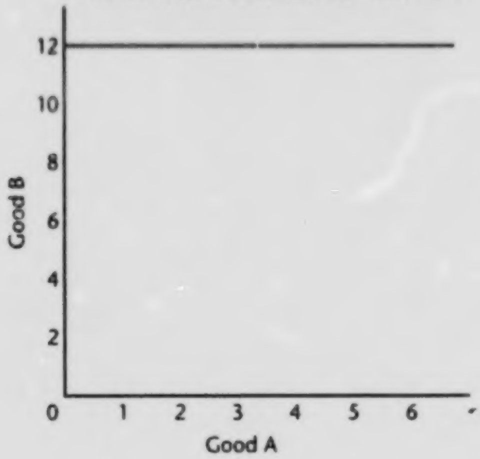
   a. the opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of __**2**__ unit(s) of Good B. **[12 → 10 = –2]**

   b. the opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of __**4**__ unit(s) of Good B. **[10 → 6 = –4]**

   c. the opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of __**6**__ unit(s) of Good B. **[6 → 0 = –6]**

   d. This is an example of *(~~constant~~/increasing/~~decreasing~~/~~zero~~)* opportunity cost per unit for Good A.
   In terms of forgone units of Good B, it increases from 2 to 4 to 6

Production Possibilities Curve 3



ACTIVITY 2 ANSWER KEY continued

3. If the economy represented in *Production Possibilities Curve 3* is presently producing 12 units of Good B and 0 units of Good A:

   a. the opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of __0__ unit(s) of Good B. **[Still have 12]**

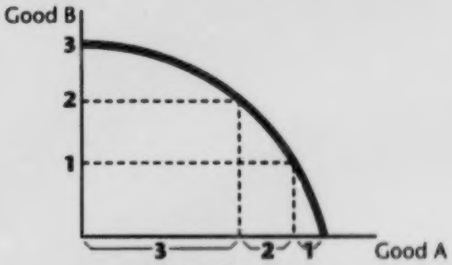
   b. the opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of __0__ unit(s) of Good B. **[Still have 12]**

   c. the opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of __0__ unit(s) of Good B. **[Still have 12]**

   d. This is an example of *(~~constant~~/~~increasing~~/~~decreasing~~/zero)* opportunity cost per unit for Good A. **Good A is a "free good." You do not have to give up any Good B to get it.**

B. Use the following axes for *Production Possibilities Curves 4, 5,* and *6* to draw in the type of curve that illustrates the labels given below each axis.

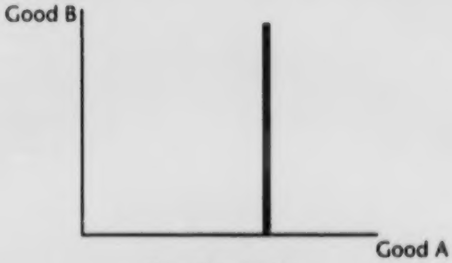
Production Possibilities Curve 4



Increasing Opportunity
Cost per unit of Good B

In terms of forgone units of Good A 3>2>1.

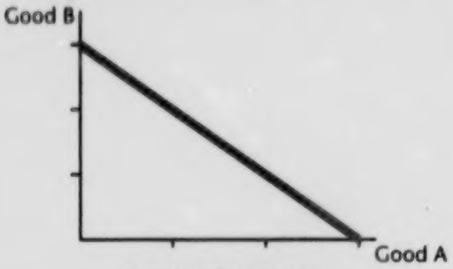
Production Possibilities Curve 5



Zero Opportunity
Cost per unit of Good B
(Good B is a free good)

You do not have to give up any Good A to get Good B.

Production Possibilities Curve 6



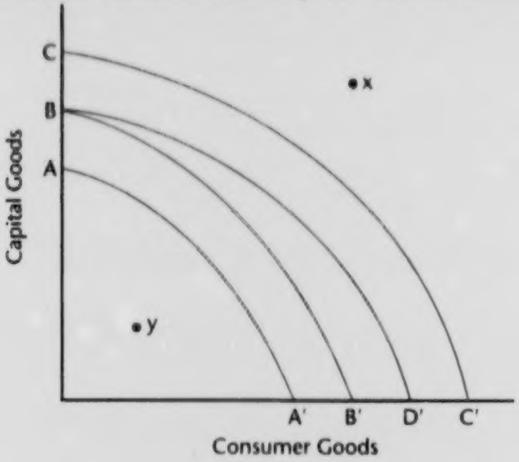
Constant Opportunity
Cost per unit of Good B

In terms of forgone units of Good A, you give up the same amount for each additional amount of Good B.

ACTIVITY 2 ANSWER KEY continued

C. Use the following production possibilities diagram to answer each of the questions that follow. Each question starts with curve BB′ as a country's production possibilities curve.

Production Possibilities: Capital and Consumer Goods



1. Suppose there is a major technological breakthrough in the consumer goods industry, and the new technology is widely adopted. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) **BD′**

2. Suppose that a new government that forbids the use of automated machinery and modern production techniques in all industries comes into power. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) **AA′**

3. Suppose massive new sources of oil and coal are found within the economy, and there are major technological innovations in both sectors of the economy. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) **CC′**

4. If BB′ represents a country's current production possibilities frontier, what can you say about a point like x? (Write a brief statement.)

   It is impossible to attain with existing resources and technology.

5. If BB′ represents a country's current production possibilities frontier, what can you say about a point like y? (Write a brief statement.)

   The economy is not fully utilizing existing resources and technology. An example of Point y is the Great Depression of the 1930s.

ACTIVITY 3 **ANSWER KEY**
Scarcity, Opportunity Cost, Values, and Choice

Unfortunately for you, both your mathematics and economics teachers have decided to give tests two days from now. (Remember, this is a fictitious example.) You have pondered the problem and realize that you can spend a **total of 9 hours** studying for **both** exams. Your real problem is to decide how to allocate your 9 hours (scarce resource) in studying for both exams (competing goals).

After some deep thought, you construct the following tables to guide you in this decision. These tables tell you what score you expect to get in each course, given the number of hours you might spend studying for each exam.

Economics: Study and Score

Number of Hours Studied	Expected Score
0	0
1	26
2	48
3	61
4	73
5	83
6	91
7	97
8	100

Mathematics: Study and Score

Number of Hours Studied	Expected Score
0	0
1	24
2	44
3	62
4	75
5	84
6	91
7	96
8	100

Part A.
The first problem is to decide what values you attach to the courses.

1. If economics has the highest priority, i.e., you want to get 100 on the economics exam, what will your score on the mathematics test be? **24**

2. If mathematics has the highest priority, i.e., you want to get 100 on the mathematics exam, what will your score on the economics test be? **26**

3. Now suppose the minimum passing grade is 50 in each subject.

   a. An **implicit** cost of getting 100 on the economics exam is to *(~~pass~~/fail)* mathematics. (Cross out one.)

   b. An **implicit** cost of getting 100 on the mathematics exam is to *(~~pass~~/fail)* economics. (Cross out one.)

ACTIVITY 3 ANSWER KEY continued

Part B.

Suppose now that instead of trying for 100 in one course, you want to get the highest possible combined score, using the 9 hours you have available for studying.

1. One way to proceed is to compare all different 9-hour combinations. To do this, complete the following table by filling in all of the blank spaces.

Combinations of Economics and Mathematics Study

Total Hours		Scores		
Economics	Mathematics	Economics	Mathematics	Combined Score
8	1	100	24	124
7	2	97	44	141
6	**3**	**91**	**62**	**153**
5	**4**	**83**	**75**	**158**
4	**5**	**73**	**84**	**157**
3	**6**	**61**	**91**	**152**
2	**7**	**48**	**96**	**144**
1	**8**	26	**100**	**126**

What is the "best" allocation of study hours in terms of attaining the highest combined score? **5** hours economics and **4** hours mathematics

2. An alternative method of finding the "best" allocation of study hours is to do what economists call *working at the margin*. In order to utilize this method we must go back to our original tables and add a third column to each one as is done below. These columns, labeled "marginal increase" in the table, give the *change* in the expected score which will results from a one-hour *change* in study time spent upon each particular course.

Marginal Increase of Mathematics and Economics Study

ECONOMICS			MATHEMATICS		
Hours	Scores	Marginal Increase	Hours	Scores	Marginal Increase
0	0		0	0	
		26			24
1	26		1	24	
		22			20
2	48		2	44	
		13			18
3	61		3	62	
		12			13
4	73		4	75	
		10			9
5	83		5	84	
		8			7
6	91		6	91	
		6			5
7	97		7	96	
		3			4
8	100		8	100	

ACTIVITY 3 ANSWER KEY continued

You now proceed by asking: "Where should I use each additional (marginal) hour?" The answer is: "Where it will do the most for increasing my combined score." For example, the first hour of study can be allocated to economics or mathematics. If it is allocated to economics, your total score will increase by 26; if it is allocated to mathematics, your total score will increase by 24. Hence, it is best to allocate hour number 1 to economics. The second hour can either increase your economics score by 22 or your mathematics score by 24—give it to mathematics. Complete all of the appropriate blanks in the table below to record your results. Remember that as you allocate an additional hour to mathematics or economics you move down one row in the corresponding table above.

Allocation of Time to Economics and Mathematics Study

Hour	Allocate to			Marginal	Total
Number	Economics		Mathematics	Increase	Score
1	X			26	26
2			X	24	50
3	**X**			**22**	**72**
4			**X**	**20**	**92**
5			X	18	**110**
6		**← X →**		**13**	**123**
7		**← X →**		**13**	136
8	**X**			12	**148**
9	**X**			**10**	**158**

Total hours: Economics: **5**

Mathematics: **4**

Total Scores: **158**

Explain why these answers agree with your answers in question 1 above.

The sum of the marginal increases adds to the total combined score, or "marginals add to totals."

Indicate the hour(s) at which it makes no difference to allocate an additional hour of study to economics or mathematics.

No difference at hours 6 and 7. Either economics or mathematics would raise the total score by 13 points.

ACTIVITY 3 ANSWER KEY continued

Part C.

Now you have figured out three alternative ways to allocate your time **1:** 8 economics, 1 mathematics; **2:** 1 economics, 8 mathematics; **3:** 5 economics, 4 mathematics. Assuming that these three alternatives are the only ones you consider:

a. the opportunity cost of selecting alternative **1** would be the loss of alternative __**2**__ or alternative __**3**__ depending on which of these alternatives you prefer.

b. the opportunity cost of selecting alternative **2** would be the loss of alternative __**1**__ or alternative __**3**__ depending on which of these alternatives you prefer.

c. the opportunity cost of selecting alternative **3** would be the loss of alternative __**1**__ or alternative __**2**__ depending on which of these alternatives you prefer.

The choice you make depends on your values and priorities. The alternative you select should be the one you value most. In order words, this means you should select the alternative with the *(~~highest~~/lowest)* opportunity cost as the "best" alternative. (Cross out one.)

Which alternative will you choose? Why? What is its opportunity cost for you?

Students should make criteria explicit. Only with specific criteria can one alternative be chosen over another.

Part D.

Food for Thought

The preceding analysis may seem very artificial to you. To see the "real world" meaning of this exercise, change things so...

- Rather than 9 hours, you have $9 billion to allocate.
- Rather than exams, you must choose between two programs: social security payments (economics) and defense needs (mathematics).
- Rather than test scores, you have some measure of society's total welfare. **Discuss: Is this possible? Can it be measured?**
- Rather than being a student, you are a Member of Congress.

Look over your allocation of study hours from the Table *Allocation of Time to Economics and Mathematics Study* as though they were billions of dollars. Would you change anything? Why or why not?

Students need an explicit preference or criterion function. Can Social Security and defense programs be measured on the same scale? N.B. Marginal adjustments are possible. It does not have to be all or one or all of the other.

ACTIVITY 4 **ANSWER KEY**
The Cost of College Education

The economic costs of a choice can vary depending on which group is considered. Differences in these costs can cause differences in opinion about the desirability of various economic policies. For example, place yourself in the position of a person who contemplates going to college and living in a dormitory. Your job is to figure out how much it will cost you and others for you to attend college for one nine-month school year, i.e., the cost of a student-year. The following figures are presented to you. (Use only these figures, realistic or unrealistic as they may be.) Consider these data carefully; then answer the questions below in the space provided.

a. Tuition: $2,400/student-year.
b. Textbooks and school supplies: $900/student-year.
c. Faculty and administrative salaries and other university expenses budgeted by the Board of Trustees from a fund provided by the state legislature: $2,200/student-year.
d. Contributions to the university from alumni, private foundations, and other sources: $600/student-year.
e. You can normally work and earn $800/month when you aren't going to school. But now, except for the summer, you go to school full-time and cannot work for nine months of the year.
f. You receive a scholarship of $500/year from the Board of Trustees from funds provided by the state legislature.
g. It costs $200/month to live at home.
h. Dormitory fees are $400/month.

1. a. How much would it cost you, as a student, to attend college for a nine-month school year? Indicate the components of your cost. (You may want to review the list of Key Ideas for Unit 1.)

	EXPLICIT COST	+		IMPLICIT COST	=	TOTAL ECONOMIC (OPPORTUNITY) COST
a - f (2,400 - 500)	1,900		e (800 x 9)	7,200		
b	900		-g (200 x 9)	1,800		
h (400 x 9)	3,600					
	6,400	+		5,400	=	$11,800

b. How much would it cost state taxpayers to send you to college for this time? Indicate the cost components. (Note that any money provided by the state legislature is a cost to taxpayers.)

c	2,200
f	500
	2,700

c. How much would it cost **society** to send you to college for this time? Indicate the cost components. (Note that the idea of "society" here is everyone who makes a contribution to paying for the student-year, e.g., you the student (or parents), taxpayers, and others who may be involved.)

d 600	CONTRIBUTIONS	600
	STUDENT	11,800
	TAXPAYERS	2,700
		$15,100

ACTIVITY 4 ANSWER KEY continued

2. Suppose the state legislature decides that it is no longer desirable to devote so many public resources to education. Thus, (1) tuition increases by $300 to **$2,700** per student-year; (2) salaries and other university expenses budgeted by the Board of Trustees from funds provided by the state legislature fall by $300 to **$1,900** per student-year; (3) Your scholarship falls by $150 to **$350** per year.

   Make these changes in the cost data on page 15, and answer the following:

   a. How much would it now cost **you,** as a student, to attend college for a nine-month school year? Indicate the components of your cost.

EXPLICIT COST		**+**	**IMPLICIT COST**		**=**	**TOTAL ECONOMIC (OPPORTUNITY) COST**
a–f (2,700 – 350)	**2,350**		**e (800 x 9)**	**7,200**		
b	**900**		**–g (200 x 9)**	**1,800**		
h (400 x 9)	**3,600**					
	6,850	**+**		**5,400**	**=**	**$12,250**

   b. How much would it now cost **state taxpayers** to send you to college for this time? Indicate the cost components.

c	**1,900**	
f	**350**	
	2,250	**(+ loss of taxes on e and d??)**

   c. How much would it now cost **society** to send you to college for this time? Indicate the cost components.

d CONTRIBUTIONS	**600**
STUDENT	**12,250**
TAXPAYERS	**2,250**
	$15,100

3. Summary

   a. Did the cost of a college education rise or fall under this policy? (Be sure to consider more than one perspective in your answer.)

   Increased for students. Decreased for taxpayers. Stayed the same for society.

   b. Are there other implicit costs that might arise from this policy change? (Hint: Consider the social benefits of college education.) Explain.

   Yes. The increased cost to students might discourage some people from going to college, and society would lose the benefits of more college-educated workers and citizens.

UNIT 1, LESSON 3

Different Means of Organizing an Economy

Introduction and Description

In all societies, people must organize to deal with the basic problems raised by scarcity and opportunity cost. A society must decide what goods and services to produce, how to produce them, and how to distribute them. Societies use three approaches—tradition, command, or market—to solve the basic problems.

This lesson can provide the framework for later units that cover price theory and the theory of the firm. If you wish to expand this lesson, bring in current articles on life in the United States and in the countries that had been republics of the former Soviet Union. Activities 5 and 6 represent traditional ways to discuss these issues. Activity 7 applies the concepts to an issue of interest to students. Activity 8 applies the concepts to life in Russia under communism.

Objectives

1. Identify the conditions that give rise to the economic problem of scarcity.
2. Identify the opportunity costs of various courses of action involving a hypothetical problem.
3. Identify the three questions that every economic system must answer.
4. Analyze the advantages and disadvantages of each of the three economic systems (market, command, tradition).
5. Describe and analyze the different economic goals of different economies.
6. Determine the mix of tradition, command, and market in different economies.
7. Analyze why communism failed.

Time Required

- Two and one-half class periods

Materials

1. Activities 5, 6, 7, and 8
2. One situation card for each student (included in this lesson)
3. Seven signs, each with the name of an economic goal on it

Procedure

1. Before using the Activities, give a lecture about the fundamental economic problems. In your discussion, show how the market system answers the questions of what, how, and for whom to produce. Also prior to using the Activities, copy and cut out the situation cards (one per student) included in this lesson.
2. Have the students read Activity 5. Then discuss the approaches of tradition, command, and market economies. Tell the students that not every society solves these problems in the same way.
3. To illustrate this, put the following three column headings on the board: *Market*, *Tradition*, and *Command*. Then place one situation card face down on each student's desk. Tell the students that they are in three different economics classes in which they received their grade for the first grading period today just before going to lunch. They are now in the lunchroom sharing their good or bad fortune, as the case may be. Have students turn their cards over and, one at a time, read the descriptions to the class. After each situation, have someone in the class tell how the grade decision was made (tradition, command, or market) and place the card under the appropriate heading on the board. These cards are meant to express attitudes and in no way represent the true facts of a real school and its grading system. The whole purpose is to relate tradition, command, and the market to something—grades—with which students are familiar.
4. After all of the cards have been classified on the board, ask students to think of other

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Faye Ison, Horace Mann High School, Gary, IN; Dawn Kurtz, Larkin High School, Elgin, IL; Dwain Myers, Lincoln East High School, Lincoln, NE; and Diana Spinnati, Mansfield City Schools, Mansfield, OH, made major contributions to this lesson.

LESSON 3 continued

examples of decisions made by any of the three systems. Discuss several examples.

5. Then put the students into small cooperative groups of four, and ask them to list advantages and disadvantages of each of the three systems (about five minutes). Have each group offer one advantage or disadvantage that no other group has named.

6. Finally, have the students think of examples of tradition, command, and market elements in the United States and write them at the end of Activity 5.

7. Have the students read Activity 6. Discuss the goals of an economy. You might point out that different goals may predominate at different times. For example, most economies (except traditional economies) have economic growth as a goal and they strive to achieve as much growth as possible. But if pursuit of growth brings inflation with it, the attempt to curb that inflation may lead to a temporary abandonment or a lesser emphasis on the goal of economic growth.

8. Have the students prioritize from 1 to 7 the goals from the perspective of the priority they think each goal is actually given in the U.S. economy today (Column 1) and the priority they think each goal should receive (Column 2).

9. While students are prioritizing the goals, place signs with the name of each goal around the classroom walls.

10. Have students move to the area of the room close to the goal they think is given top priority in the United States.

11. Go around the room asking students who have chosen each goal to explain the reasons for their choice.

12. Ask students to go to the goal they think *should* receive the top priority and repeat the process used in step 11.

13. Conclude the Activity with a brief discussion in which students discuss any goals that might conflict with each other, any goals that might be especially compatible, and ideas this Activity has demonstrated.

14. Have the students read Activity 7. This case study helps students to apply tradition, command, and market systems to an issue that is more concrete to them. The students should answer the questions at the end of the case study.

15. Discuss the case study. In the discussion, you may want to bring up how parking spaces are distributed at your high school. As in all case studies, encourage students to differ. Some questions have specific answers while others have no "right" answer.

16. Now have students read Activity 8 and answer the questions at the end of the reading.

17. Discuss the article and explain that communism failed to achieve most of the goals that are considered important in a successful economy.

Answers: Activity 5

These are some possible answers. Many other examples would also be correct.

Tradition

1. **Some children go into the same occupations as their parents.**
2. **Tips are given to people who perform personal services, such as taxicab drivers and people who wait on tables in restaurants.**
3. **Welders are usually men.**

Command

1. **Governments tax citizens.**
2. **Governments require children to attend school.**
3. **Governments set safety standards for highways, buildings, vehicles, etc.**

Market

1. **Supply of and demand for workers determine their wages.**
2. **Businesses seek profits by producing what consumers want.**
3. **The buying choices of consumers expressed in the market largely determine what is produced.**

ACTIVITY 7 **ANSWER KEY**
Campus Parking

1. What is the central problem that Stanford faces in parking spaces?
   Because the supply of parking spaces is limited, the scarce good must be allocated among those people who want parking spaces.

2. What are the three ways societies deal with scarcity? Categorize the five methods Stanford could use to allocate parking spaces. Which use tradition? command? the market?
   Tradition, market, command
   a. "Leave things as they are" and "First come, first served" combine tradition and command.
   b. "Markets and a price system" are market.
   c. "Democracy" is a political solution, which is command.

3. Explain how each method of allocating parking spaces affects *equity.*
   Equity is hard to define. There is a definition in Activity 6. Nevertheless, what is considered fair by the students might not be considered fair by the faculty.

4. Explain how each method of allocating parking spaces affects *efficiency.*
   Efficiency is also tough to define. A price system would encourage efficiency because people would have to weigh the benefits of a parking space against the opportunity costs. Should preference be given to those who stay all day? Is it important to ensure that professors get to class on time? Does price guarantee that people who value the space most will make the greatest sacrifice?

5. Which system of allocating parking spaces do you recommend? Why?
   The discussion should show that these decisions are not easy.

ACTIVITY 8 **ANSWER KEY**
Why Communism Failed

1. What economic system did Russia use before communism?
Command with the czar and aristocracy in charge.

2. According to Valentina Kosieva, what economic system had the most emphasis under the New Economic Policy?
Market. Lenin instituted market reforms in the New Economic Policy to get the economy going.

3. Why do you think the New Economic Policy was ended?
Communists wanted once again to control the economy.

4. Was communism primarily based on tradition, command, or the market system? *(Circle one.)*
Command

5. Evaluate the communist system using Valentina Kosieva's story and reading from your textbook. How would you evaluate the performance of communism on these goals?

Economic Freedom

Economic Efficiency

Economic Equity

Economic Security

Full Employment

Price Stability

Economic Growth

Students may need additional background to answer this question. Answers may differ, but clearly communism did not provide economic efficiency, freedom, or growth. The standard of living was very low under communism, a few people were very rich, but most were very poor. Communism had full employment although many jobs were low paying and meaningless. Price stability was achieved through price controls; this resulted in shortages.

SITUATION CARDS

Traditional System

You are a male student.
Males traditionally do well in
the sciences.
Your grade is an A.

You are 6′ 5″—basketball
material. I well help you.
Do not worry—you will
be eligible.
Your grade is a D.

Your name is Jones.
No member of your family has
ever gotten higher than a D in
my class.
Therefore, your grade is D.

You are a female.
Females traditionally do worse
in sciences than males.
Your grade is a B.

Your family is influential
and all your relatives have gone
to college.
Your grade is an A.

I had your brother in
class several years ago. He never
did anything in class. He
received an F.
Therefore, you receive an F.

You are a member of a
minority group that is not
expected to do well.
Your grade is a D.

You are a member of a minority
group that is expected
to do well.
Your grade is an A.

SITUATION CARDS

Market System

Your grade will be what you make it.	Your grade will be what you make it.
Your grade will be what you make it.	Your grade will be what you make it.
Your grade will be what you make it.	Your grade will be what you make it.
Your grade will be what you make it.	Your grade will be what you make it.

SITUATION CARDS

Command System

10% of you will receive an A.

10% of you will receive an F.

15% of you will receive a B.

15% of you will receive a D.

50% of you will receive a C.

50% of you will receive a C.

50% of you will receive a C.

50% of you will receive a C.

UNIT 1, LESSON 4

Absolute and Comparative Advantage, Specialization, and Trade

Introduction and Description

Activity 9 introduces *absolute advantage* and *comparative advantage*. Although these concepts are covered in more detail in the international trade unit in macroeconomics, they explain economic activities intranationally as well. Students who take the microeconomics AP exam will be tested on them.

People trade because both parties stand to benefit when they engage in voluntary exchanges. Comparative advantage is a powerful concept that helps explain how mutual benefits can occur from exchange. A nation and an individual have a comparative advantage when they can make one or more products at a lower opportunity cost than they can produce others. Specialization in the lower-cost product creates a surplus, which is traded to other producers for products that would have been more costly to make. To determine a comparative advantage, cost must be measured in terms of what other products must be forgone in order to make a particular product. This relative measure is a subtle, difficult, and very important idea for students to understand. A nation's or an individual's comparative advantage will change as the prices of products made available by different trading partners change.

Objectives

1. Define *comparative advantage* and *absolute advantage*.
2. Describe and give examples of the law of comparative advantage.
3. Explain how both parties in a trade gain from voluntary exchange.
4. Define *specialization* and *exchange*.

Time Required

- One class period

Materials

Activity 9

Procedure

1. Introduce the concepts of *absolute advantage, comparative advantage, specialization,* and *trade*.
2. Have the students work through the problems in Activity 9 and go over the answers. In discussing the Activity, make these points:
   a. Was Ma right? Should the Hatfields and McCoys trade? Why? (On the basis of comparative advantage, each family and the total system can gain wealth by specializing and trading. The Hatfields are better in the production of both cloth and corn, but they can still gain by trading with the less efficient McCoys and specializing in what they do best, which is raising corn. This is important because it explains why it is to our advantage to specialize and trade with less efficient nations and why it is to their advantage to specialize and trade with the United States.)

   b. Does anyone support no trade? Why? (The mathematical figures should help illustrate the advantages of specialization and trade. But there may be students for whom the issues of dependency or quality would provide a basis for not trading. These are legitimate concerns and can be discussed in light of national security issues and personal consumer preferences.)

ACTIVITY 9 **ANSWER KEY**
The Hatfields and the McCoys

To produce corn and cloth, the Hatfields must spend:

8 hours for 1 bushel of corn
10 hours for 1 yard of cloth
18 hours for total production of 1 bushel of corn and 1 yard of cloth

To produce corn and cloth, the McCoys must spend:

15 hours for 1 bushel of corn
12 hours for 1 yard of cloth
27 hours for total production of 1 bushel of corn and 1 yard of cloth

If the Hatfields produce only corn and trade 1 bushel of corn for 1 yard of cloth, they would spend:

16 hours for 2 bushels of corn
16 hours to have 1 bushel of corn and 1 yard of cloth through trade

If the McCoys produce only cloth and trade 1 yard of cloth for 1 bushel of corn, they would spend:

24 hours for 2 yards of cloth
24 hours to have 1 yard of cloth and 1 bushel of corn through trade

If the Hatfields and McCoys specialize in the lowest cost production, will they gain any time?

2 hours for the Hatfields; 3 hours for the McCoys

1. Will both families gain in the trade?	**Both families gain by trade.**
2. Who had an absolute advantage in corn?	**Hatfields**
3. Who had an absolute advantage in cloth?	**Hatfields**
4. Who had a comparative advantage in corn?	**Hatfields**
5. Who had a comparative advantage in cloth?	**McCoys**

UNIT 1, LESSON 5

Practice in Applying Economic Reasoning

Introduction and Description

This lesson reinforces some of the economic reasoning ideas that were introduced in Lesson 1. It provides practice in applying economic reasoning to a wide variety of conventional and unconventional situations. Activity 10 emphasizes marginalism, a concept used throughout the course. In this case, marginal or additional benefits are compared to marginal or additional costs. Activity 11 is a problem set that illustrates the idea that economic principles affect all kinds of behavior, not just financial, business, or consumer behavior.

Objectives

1. Describe and give examples of the law of comparative advantage.
2. Explain how both parties in a trade gain from voluntary exchange.
3. Describe and analyze the "economic way of thinking."
4. Graph and distinguish among *inverse, direct,* and *zero relationships*.
5. Identify the opportunity costs of various courses of action involving a hypothetical problem.
6. Apply scarcity concepts to a variety of economic and noneconomic situations.
7. Define *specialization* and *exchange*.

Time Required

- One and one-half class periods

Materials

Activities 10 and 11

Procedure

1. Initiate a discussion of the concept of marginalism. In economics, decisions should always be made at the margin. The marginal benefits and marginal costs associated with a choice will determine the effects and wisdom of our decisions. Tell students they will return to marginal analysis throughout the course.
2. Have the students read Activity 10 and answer the questions at the end of the reading.
3. Discuss the answers to Activity 10.
4. Assign Activity 11 as homework a few days before discussing the answers. Tell the students to write out the answers. You could collect this as homework or have the students discuss the answers in small groups.
5. Have a general class discussion on the problems.

ACTIVITY 10 **ANSWER KEY**

Anything Worth Doing Is Not Necessarily Worth Doing Well

1. Why might you not work to get an A on your next economics test?
   You might have to study for another course, work to earn money, or participate in extracurricular activities.

2. Why might your teacher want you to do a better paper than you want to do?
   He or she does not have to bear the cost.

3. Why is the marginal benefit (MB) curve downsloping?
   You get fewer additional benefits from something as you get more of it. This is called *diminishing marginal utility*.
   (Later, students will see that diminishing marginal utility determines the shape of the demand curve.)

4. Why is the marginal cost (MC) curve upsloping?
   Marginal cost is upward-sloping because of the law of diminishing returns.

5. How should you determine how well you should do something?
   You should devote more time to a task until the marginal utility equals the marginal cost.

6. Can you think of something you didn't do well recently? Explain why you didn't do it as well as you could have.
   This question should translate economic terminology into everyday decisions.

7. Explain in your own words why something worth doing is not necessarily worth doing well.
   Try to get the students to explain it without economic terminology.

ACTIVITY 11 **ANSWER KEY**
Thinking in an Economic Way

Economics is a way of thinking that views people as rational decision makers. Economists believe people prefer more to less. While each person has different values, all people seek to maximize their welfare. Some people want fast cars and yachts; some want big houses and a good life for their families; and others may even value education.

Because of costs, people cannot get everything they want. As you answer these problems, you must be sure to evaluate costs and benefits. And never forget the concept of scarcity.

1. True, false, or uncertain, and why? "The best things in life are free."
   ***False.* The best things in life are not free. Students may assert that the best things in life are love and friendship, and these are not economic goods. But love and friendship have opportunity costs.**

2. Is life priceless? Give at least four examples to support your opinion. Use the concept of opportunity cost in your answer.
   ***False.* This question is controversial. Nevertheless, if life were priceless, we would not use life as an opportunity cost for any other benefit. Yet we fight wars. On a less dramatic level, the "benefits" of smoking, drinking, hang gliding, using illegal drugs, driving without a seat belt, and driving at excessive speeds confront one with the risk of an increased probability of death.**

3. Teachers are usually displeased when students cheat on tests. Which of these methods intended to stop cheating would be most effective? Why?
   a. Teachers should say nothing and trust the students to be fair. If people are treated responsibly, they will act responsibly.
   b. Teachers should give lectures on morality and explain to students how their actions are not only dishonest but may hurt their classmates.
   c. Teachers should walk around the room when giving tests, give students alternate tests, and make sure the students understand they will fail if they are caught cheating.
   Only c involves opportunity costs for the student who is cheating. For some people, the opportunity cost of cheating is their conscience. Students compare benefits and costs when contemplating cheating. For those with weak consciences, other costs must be substituted to discourage them. If the costs of cheating are greater than the benefits, cheating will not occur.

4. True, false, or uncertain, and why? "The economic concept of scarcity is not relevant to a modern economy such as the United States. Americans are surrounded by vast quantities of unused goods. For example, food fills the supermarkets, and every car dealer has many cars in the showroom and lot. Americans are surrounded by plenty, not scarcity."
   ***False.* Scarcity is a relative concept, not an absolute one. Resources are scarce compared to wants. Unsold stocks of goods do not prove that scarcity does not exist because these goods still have a price. If there were no scarcity, we could produce everything we wanted at a price of zero.**

ACTIVITY 11 ANSWER KEY continued

5. True, false, or uncertain, and why? "Money is one of America's most important economic resources."
False. Money is not a resource. If the government prints more money, it does not affect the number of goods and services used to satisfy our wants.

6. An economics professor got a new job in a new town. When he arrived in the new town, he wanted to rent an apartment. He pulled into the first gas station he saw, filled up his tank, and drove around inspecting apartments. He rented the tenth apartment that he inspected. Does his behavior make sense economically, or did he fail to practice what he preaches? Use marginal benefit and marginal cost analysis in your answer.
It does. The benefits of finding a cheaper gas station were not as high as the opportunity cost. It was not until the tenth apartment that the additional benefits and additional opportunity costs of searching for apartments were equal. This makes sense. After all, a good place to live at a reasonable cost is more important than saving a few cents a gallon on gas.

7. Tina is an outstanding lawyer. She also types faster than anyone else in her town. Tom types at half the speed of Tina. Tom is not a lawyer. Should Tina hire Tom? Why or why not? Use the concepts of absolute and comparative advantage in your answer.
Tina should hire Tom. The key is the law of comparative advantage. Tina sacrifices an hour of legal fees if she does her own typing. She can probably pay several Toms to type for less than she can earn in an hour. Therefore, she specializes in law, and Tom specializes in typing.

Answers to Sample Multiple-Choice Questions

1. d
2. d
3. e
4. b
5. e
6. d
7. b
8. a
9. a
10. b
11. d
12. c
13. c
14. c
15. c

Answers to Sample Short Essay Questions

1. Scarcity is the reason that there is no such thing as a free lunch. Scarcity exists because while resources are limited, wants are unlimited. Because we cannot have everything we would like, we must choose among alternatives. There is an opportunity cost for every choice we make. All scarce resources have a cost.
2. *False.* If garbage were scarce, we would pay a positive price for it. We pay people to remove our garbage. Therefore, garbage collection is scarce. To be scarce, a good must be both limited and desirable.
3. The law of comparative advantage states that a nation's output will be greatest when each product is produced by the person who has the lowest opportunity cost. The true cost of producing something is what is sacrificed in order to produce it.
4. *False.* People with one million dollars cannot spend more than one million dollars. Even if people had as much money as they could use, the time to use it would be scarce.

Answers to Sample Long Essay Questions

1. a. Scarcity exists because there are limited resources to fulfill unlimited wants.

   b. What to produce and how much of each good or service to produce

   How to produce

   For whom to produce

   c. Tradition, command, and market

   d. Answers will vary.

2. Graph A assumes increasing costs. The shape of the curve is concave to the origin or bowed out. If you move from a to e, you must give up increasing amounts of guns to get more butter. This is what a production possibilities curve should look like.

   Graph B assumes constant costs. As you go from a to e, the tradeoffs do not change.

   Graph C, a curve convex to the origin, assumes decreasing costs.

   Economic theory supports Graph A as a graph that correctly represents the law of increasing cost.

Visual 1.1

The Economic Way of Thinking

1. Everything has a cost.
2. People choose for good reasons.
3. Incentives matter.
4. People create economic systems to influence choices and incentives.
5. People gain from voluntary trade.
6. Economic thinking is marginal thinking.
7. The value of a good or service is affected by people's choices.
8. Economic actions create secondary effects.
9. The test of a theory is its ability to predict.

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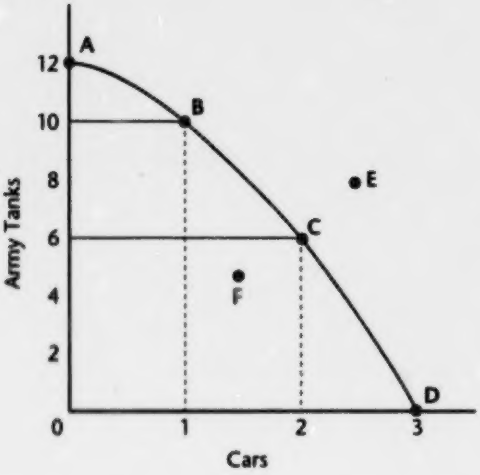
Visual 1.2

Production Possibilities Curve



1. What are the tradeoffs involved?
2. Why is the PPC concave, or bowed out, from the origin?
3. What does a point inside the PPC indicate?
4. What is the historical example of a point inside the PPC?
5. What is the significance of a point outside the PPC?
6. Under what conditions can a point outside the PPC be reached?

Transparency developed by Faye Ison, Horace Mann High School, Gary, IN, and Diana Spinnati, Mansfield City Schools, Mansfield, OH.
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Microeconomics

Unit 2

The Nature and Functions of Markets

18 Days

Unit Overview

The laws of supply and demand are always associated with economics. "Teach a parrot to say demand and supply and you have an economist," according to some wags.

Supply and demand are tools for understanding a wide variety of specific issues as well as the operation of the entire economic system. Students need a firm grasp of the laws of supply and demand to understand issues that will be discussed in subsequent units.

In this unit, students should learn that supply-and-demand curves are models for understanding human behavior. If students try merely to memorize the relationships on the graphs, they will not be able to apply supply-and-demand analysis to a wide variety of issues. Simple memorization will make it difficult to answer the complex application questions on the AP exam.

This unit contains worksheets on changes in demand, supply, and equilibrium price and quantity. It also covers elasticity of demand and supply, as well as the effects of price ceilings and floors. Income effects, substitution effects, and diminishing marginal utility are also important topics covered. The unit concludes with a series of essays on applying price theory to both conventional and unconventional situations.

Approximately twenty to thirty percent of the micro AP exam will cover this material.

Textbook Assignments

Baumol and Blinder, Chapters 4, 7, 8

McConnell and Brue, Chapters 4, 20, 21

Miller, Chapters 3, 4, 19, 20

Planning Ahead

We have added an introductory activity on the circular flow of resources and income for this edition of **Advanced Placement Economics**. This should help students see the relationships among markets that they will explore throughout the unit. We have also made *A Market in Wheat* simulation a more integral part of Unit 2, Lesson 1. There are several simulations like *A Market in Wheat*. They are important because they help students understand the behavior behind supply and demand curves. (If you use *A Market in Wheat*, you will need to take some time to make the buy and sell cards.) Otherwise, the unit can turn into practice at reading graphs rather than the study of the behavior of consumers and producers in a market economy. Throughout the unit, stress the functions of prices. Prices allocate resources, act as rationing devices, and affect the distribution of income. Activities 19 and 20 emphasize these functions. Activity 29 applies price theory to a range of problems. It is this type of complex application question that students will see on the AP test.

One of the tougher decisions is how to cover the behavior that determines the shape of the demand curve. The AP test will not cover indifference curve analysis, but the substitution effect, the income effect, and the law of diminishing marginal utility will be covered. Consumer demand, including elasticity, accounts for five to ten percent of the microeconomics exam. Most college texts have a chapter on consumer demand after elasticity. We have chosen to cover it early in Activity 13 because these factors are the reason the demand curve is downsloping, a rather fundamental point.

Unit 2 Activities

Activity 12	The Circular Flow of Resources, Goods, Services, and Money Payments
Activity 13	Reasons for Changes in Demand
Activity 14	Demand Curves, Moves Along Demand Curves, and Shifts in Demand Curves
Activity 15	Why Is a Demand Curve Downsloping? The Law of Diminishing Marginal Utility
Activity 16	Reasons for Changes in Supply
Activity 17	Supply Curves, Moves Along Supply Curves, and Shifts in Supply Curves
Activity 18	Equilibrium Prices and Equilibrium Quantities
Activity 19	Shifts in Supply and Demand
Activity 20	How Markets Allocate Resources
Activity 21	What Is Price Elasticity of Demand?
Activity 22	Elasticity of Demand and Changes in Total Revenue
Activity 23	Applying Elasticity to the Real World
Activity 24	Elasticity Coefficients
Activity 25	Price Floors and Ceilings
Activity 26	Rent Controls and Affordable Housing
Activity 27	The Minimum Wage and Unemployment
Activity 28	Farm Price Supports
Activity 29	Pricing Problems

Unit 2 Visuals

Visual 2.1	The Supply of and Demand for Greebes
Visual 2.2	Changes in Demand and Quantity Demanded
Visual 2.3	Determinants of Demand—Factors That Shift the Demand Curve
Visual 2.4	Changes in Supply and Quantity Supplied
Visual 2.5	Determinants of Supply—Factors That Shift the Supply Curve
Visual 2.6	Equilibrium
Visual 2.7	Shifts in Demand and Supply
Visual 2.8	Time and Elasticity of Supply
Visual 2.9	A Price Ceiling
Visual 2.10	A Price Floor

Sample Unit 2 Plan

Week 1	**Week 2**
1. Do Activity 12 in class and discuss it. 2. Use Visual 2.1 to provide an overview of supply and demand. 3. Assign Baumol, Chap. 4; McConnell, Chap. 3; Miller, Chap. 3.	1. Discuss Activities 16 and 17. 2. Assign Miller, Chap. 4, pp. 79-86.
Play *A Market in Wheat* simulation.	1. Lecture/Discussion on equilibrium, using Visual 2.6. 2. Have students do Activity 18 and discuss the answers.
1. Finish debriefing *A Market in Wheat* simulation. 2. Lecture/Discussion on the law of demand and determinants of demand, using Visuals 2.2 and 2.3. 3. Assign Activities 13 and 14. Optional: Selected readings on why a demand curve is downsloping: Baumol, Chap. 8; McConnell, Chap. 21; Miller, Chap. 19.	1. Lecture/Discussion on shifts in demand and supply, using Visual 2.7. 2. Have the students complete Activity 19 in class.
1. Discuss Activity 13 and Activity 14. 2. Lecture/Discussion on income effect, substitution effect, and law of diminishing marginal utility. 3. Assign Activity 15.	1. Discuss Activity 19. 2. Have the student complete Activity 20 in class. 3. Assign Baumol, Chap. 7; McConnell, Chap. 20; Miller, Chap. 20.
1. Discuss Activity 15. 2. Lecture/Discussion on law of supply and determinants of supply, using Visuals 2.4 and 2.5. 3. Assign Activities 16 and 17.	1. Discuss Activity 20. 2. Lecture/Discussion on factors that make a demand curve elastic or inelastic. 3. Assign Activity 21.

SAMPLE UNIT 2 PLAN continued

Week 3	**Week 4**
1. Discuss Activity 21. 2. Lecture/Discussion on total revenue method of calculating elasticity of demand. 3. Assign Activities 22 and 23.	Discuss Activity 29. If this was not assigned in advance have the students answer the question in groups.
1. Discuss Activities 22 and 23. 2. Lecture on calculating elasticity coefficients. 3. Lecture/Discussion on elasticity of supply, using Visual 2.8. 4. Assign Activity 24, Baumol, Chap. 4, pp. 91-99; McConnell, Chap. 20, pp. 395-400; Miller, Chap. 4, pp. 86-95.	Review for test using Sample Multiple Choice and Essay Questions.
1. Discuss Activity 24. 2. Lecture/Discussion on elasticity of supply, using Visual 2.8. 3. Lecture/Discussion on price ceilings and price floors, using Visuals 2.9 and 2.10. 4. Assign Activity 25, Activity 29 for homework due in 3 days.	Unit Test.
1. Discuss Activity 25. 2. Have students do Activity 26 in class and discuss it. 3. Have students do Activity 27 in class and discuss it.	
Have students do Activity 28 in class and discuss it.	

UNIT 2, LESSON 1
A Market Economy

Introduction and Description

This lesson is designed to provide a perspective on how prices allocate resources in a market economy. First, the diagram *The Circular Flow of Resources, Goods, Services, and Money Payments* illustrates the interdependence of a market economy. Second, the simulation *A Market in Wheat* helps show how prices in any market are determined subject to the forces of supply and demand.

Objectives

1. Describe and analyze *The Circular Flow of Resources, Goods, Services, and Money Payments.*
2. Describe and analyze the behavior of buyers and sellers in a competitive marketplace.
3. Provide an overview of supply, demand, and equilibrium.

Time Required

- Two class periods

Materials

1. Activity 12
2. All materials for *A Market in Wheat* simulation
3. Visual 2.1

Procedure

1. Have the students read Activity 12.
2. Go over the circular-flow diagram with the students.
3. Have the students write out the answer to the questions in Activity 12, and discuss the answers to the questions.
5. Using Visual 2.1, give the students an overview of supply and demand. Discuss supply, demand, and equilibrium with the class.
6. Play *A Market in Wheat* game. (The originals for cards, tally sheets, and handouts for the simulation are in this lesson.)

Answers: Activity 12

1. a. A resource owner is anyone who has land, labor, capital, or entrepreneurship to sell in the factor market.
   b. Business firms buy these resources and in turn sell goods and services to resource owners.
2. A market where finished goods and services are bought and sold.
3. Answers will vary; any purchase of a good or service will do.
4. A market where the factors of production (land, labor, capital, and entrepreneurship) or economic resources are bought and sold.
5. It probably would be wages for labor although many other transactions are possible.
6. Supply and demand.
7. Supply and demand.
8. From selling their resources (land, labor, capital, and entrepreneurship).
9. From selling the goods and services they produce with the factors of production.
10. Interdependence is important because people specialize and trade their production in markets for other products they need. The study of supply and demand is the study of how those markets work.

A Market in Wheat*

The simulation in this lesson is designed to show students how a competitive market works. Although most product and service markets are not so competitive as the wheat market in this game, by playing *A Market in Wheat* students can gain a better understanding of how prices are determined in any market subject to the forces of supply and demand.

Materials

1. Thirty-two buy cards (Figure 2.1) and 32 sell cards (Figure 2.2). Make cards according to the following distribution:

Buy cards		Sell cards	
Buy Price	No.	Sell Price	No.
$3.50	2	$3.50	4
3.70	2	3.70	6
3.90	2	3.90	6
4.10	2	4.10	4
4.30	4	4.30	4
4.50	4	4.50	2
4.70	4	4.70	2
4.90	4	4.90	2
5.10	4	5.10	2
5.30	4		

2. A transparency of Figure 2.3, Class Tally Sheet
3. A copy of Handouts 2.1, 2.2, 2.3, 2.4, and 2.5 for each student
4. A set of sellers' armbands, to be used as described in Handout 2.1 . Prepare these ahead of time.

Suggested Procedures for Simulation *A Market in Wheat*

1. Read Handout 2.1 with students. (NOTE: You may wish to designate a student to handle the distribution and receipt of the buy and sell cards during the game and another to record each transaction on the tally sheet. Buy and sell cards should be kept separately and shuffled between rounds.)
2. Clear the center of room and designate it as the marketplace.
3. Divide class into two equal groups. One group will be the sellers, the other the buyers. Explain that buyers will be buyers throughout the game, and sellers will be sellers throughout the game. Give sellers their armbands.
4. Distribute Handout 2.2 (individual score sheets) on which participants can record their transactions. Review details of the score sheet if necessary.
5. Make sure students understand how to calculate "profit" on their score sheets.
6. Explain that you will conduct five rounds of trading sessions of five minutes each. After the first round, tell students the first round was for practice but that the next four rounds will count. Announce when one minute remains in each round.
7. After each trading round, allow students time to figure their net losses and gains—their "profit." Before discussion (Procedure 10), have students calculate their total profit or loss in rounds two through five.
8. Encourage students to make as many deals as they can in the time permitted. Explain that it is permissible to take a loss in order to get a new transaction card. Try not to give away the fact that the students who will have the highest profits are usually those who engage in the most transactions. This fact will be "discovered" during the discussion following completion of the game (Procedure 10).
9. During nontrading time between rounds one and two, direct students' attention to the market record on the tally sheet. Say that it contains useful information for them. Do not elaborate.

This version of The Wheat Game combines procedures used in "The Wheat Market Game," *Teacher's Manual for Economics Readings for Students in Ninth Grade Social Science*, by Mindella Schults (Developmental Economic Education Program [DEEP] of the Pittsburgh Public Schools, 1967), pp. 44-53, and "The Big Apple Game," *In The Market Place: A Basic Unit on the American Economic System* (Olympia, WA: Office of the Superintendent of Public Instruction, 1976; used by permission).

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*This activity requires a class of at least 25 students to be effective. Up to 50 students can participate if your room is large enough.

A MARKET IN WHEAT continued

10. Conduct postgame discussion:
    a. What was the price at which the wheat was most frequently sold in each round? (Have students examine data on their individual score sheets and on the class tally sheet.)
    b. In which round was the spread in price the greatest? (Examine data.)
    c. Why did the prices become more clustered? (Greater competition is the most important cause for the clustering of prices. This phenomenon represents the tendency of a competitive market to move toward an equilibrium price as information increases.)
    d. Who determined the "market price" for wheat, buyers or sellers? (Both buyers and sellers did by their interaction in the marketplace.)
    e. How did supply and demand determine the market price? (Sellers tried to get higher prices; buyers tried to get lower prices. Because there was competition among members of each group, no one could exercise control over the price.)
    f. Why were some students able to make more total profits than others? (Probable answer: They were able to conclude many transactions, each of which yielded a small profit.)

11. The buy and sell cards may also be used for an exercise in graphing. The information on the cards can be converted into supply-and-demand schedules and employed to construct a graph. The graph will consist of a line for market supply and a line for market demand. The point at which the lines intersect represents the market price for these supply and demand schedules.

    Give the students Handouts 2.3, Wheat Supply and Demand graph, and, 2.4, Supply Schedule and Demand schedule. Tell the students to construct the Handout 2.3 graph by placing dots at the points that correspond to all the combinations of prices and quantities given in the supply schedule on Handout 2.4. They should then do the same, using crosses instead of dots, for the demand schedule. Connecting the supply dots produces the supply schedule; connecting the demand crosses produces the demand schedule. Remind the students to label each curve. When they have finished, project the accompanying completed graph or give each student a copy of it.

    The graph indicates that, if given enough time, a perfectly competitive market would reach an equilibrium price of $4.30 per bushel and that 240 bushels of wheat would be sold at that price. Obviously, a price of about $4.30 will not prevail until students have played a few rounds or until they get the full hang of the game, but as the students' experience accumulates, their transactions should start to move toward the equilibrium price.

12. After students complete the graphing exercise, ask the following questions:
    a. What does the demand schedule show? (The quantities of wheat demanded at various prices. Explain to students that this schedule is what economists mean by the term *demand*.)
    b. What does the supply schedule show? (The quantities of wheat supplied at various prices. Explain to students that this is what economists mean by the term *supply*.)
    c. What relationship exists between the price of a good or service and the quantity people are willing to buy? (An inverse relationship; when prices rise, the quantity demanded decreases, and vice versa—assuming other conditions remain unchanged.)
    d. What relationship exists between the price of a good or service and the quantity people are willing to supply or produce? (A direct relationship; when prices rise, the quantity supplied increases, and vice versa—assuming other conditions remain unchanged.)

A MARKET IN WHEAT continued

13. Optional: Use the following to show the effects of changes in supply and in demand on price.
    a. Conduct one or more additional rounds of the game, but cut the number of sell cards of each denomination in half. Have students record their transaction prices and their gains or losses on their score sheets. Examine the tally sheet and ask students to explain how and why prices changed as they did. (Prices should have increased because of restricted supply.)
    b. Next, conduct one or more additional rounds with the number of buy cards of each denomination cut in half. Have students record their transactions. Examine the tally sheet and ask students to explain how and why prices changed as they did. (Prices should have decreased because of reduced demand.)

Evaluation

1. Assess the quality of student contributions to class discussions.
2. Have students take the Market Game Test, Handout 2.5.

Answer to Handout 2.3 Wheat Supply and Demand

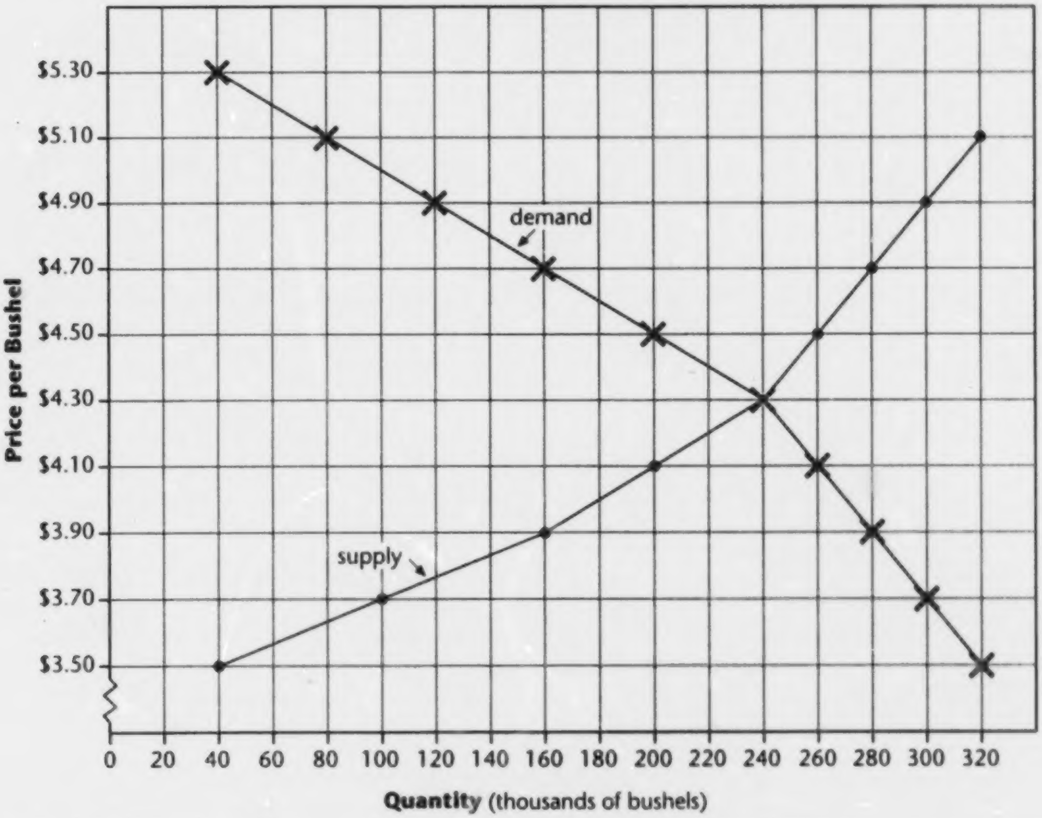


FIGURE 2.1

Buy Cards

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $5.30 per bushel, for a total of $53.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $5.10 per bushel, for a total of $51.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $4.90 per bushel, for a total of $49.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $4.70 per bushel, for a total of $47.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $4.50 per bushel, for a total of $45.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $4.30 per bushel, for a total of $43.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $4.10 per bushel, for a total of $41.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $3.90 per bushel, for a total of $39.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $3.70 per bushel, for a total of $37.00, you lose money.

You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than $3.50 per bushel, for a total of $35.00, you lose money.

FIGURE 2.2
Sell Cards

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $5.10 per bushel, for a total of $51.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $4.90 per bushel, for a total of $49.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $4.70 per bushel, for a total of $47.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $4.50 per bushel, for a total of $45.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $4.30 per bushel, for a total of $43.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $4.10 per bushel, for a total of $41.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $3.90 per bushel, for a total of $39.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $3.70 per bushel, for a total of $37.00, you lose money.

You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than $3.50 per bushel, for a total of $35.00, you lose money.

FIGURE 2.3

Class Tally Sheet

Price per Bushel	Round 1	Round 2	Round 3	Round 4	Round 5	Total of Rounds 2-5
$3.50						
$3.70						
$3.90						
$4.10						
$4.30						
$4.50						
$4.70						
$4.90						
$5.10						
$5.30						

HANDOUT 2.1

How to Play *A Market in Wheat*

Read these instructions carefully as your teacher reads them aloud.

1. The students who wear armbands are SELLERS of wheat.
2. The students without armbands are BUYERS of wheat.
3. Each buyer will have only one buy order at a time. It will say, "You are authorized to **BUY** 10 bushels of wheat, paying as **little** as possible. If you pay more than _________ per bushel, for a total of _________, you lose money." The exact price and total will be written on the order. *Do not reveal the price.* Record the price on your buy order on your own score sheet, Handout 2.2. When the round starts, try to buy at the lowest price you can. You may buy at a price higher than that on your buy card in order to obtain your wheat. As soon as you have bought wheat, record the transaction on your score sheet. Then, turn the buy and sell cards in and get another buy order from the teacher. If you have bought no wheat during a round, get a different buy order from the teacher before the start of the next round.
4. Each seller will have only one sell order at a time. It will say, "You are authorized to **SELL** 10 bushels of wheat for as **much** as possible. If you accept less than _________ per bushel, for a total of _________, you lose money." The exact price and total will be written on the order. *Do not reveal the price.* Record the price on your sell order on your student score sheet. When the round starts, try to sell your wheat at the highest price you can. You may sell at a price lower than that on your sell order in order to get rid of your wheat. As soon as you have sold wheat, record the transaction on your score sheet, Handout 2.2. Then go to the teacher to report the selling price and get another card. If you have sold no wheat during a round, get a different sell order from the teacher before the start of the next round. Remember, the SELLER reports the price.
5. When the teacher says "Start," sellers and buyers should meet and try to agree on a price for 10 bushels of wheat. Any buyer can talk with any seller.
6. The goal of both buyers and sellers is to make a profit. The buyers do so by buying wheat for a lower price than is shown on their cards. The sellers do so by selling for a higher price than is on their cards.
7. All students are free to make as many transactions in a round as time permits.
8. Every time a seller reports an agreement to the teacher, it will be entered on the tally sheet the teacher is keeping. *Watch the tally sheet so that you will know what prices are being paid.*
9. As soon as buyers and sellers receive new cards during a round, they should return to the market to try to reach another agreement with each other or with different buyers and sellers.

How to Use the Score Sheet, Handout 2.2.

Keep track of your progress during the game on this score sheet. Tally your gains and losses by taking the difference between the dollar worth of the 10 bushels as stated on your card and the dollar worth of the transaction.

If you are a buyer, you will make a gain if you buy at a lower total than the amount shown on your card. If you buy at a higher total, you will suffer a loss.

If you are a seller, you will gain if you sell at a higher total than the amount shown on your card. At a lower total, you will suffer a loss.

When the teacher instructs you to do so, total your gains and losses and write them in the designated spaces.

HANDOUT 2.2

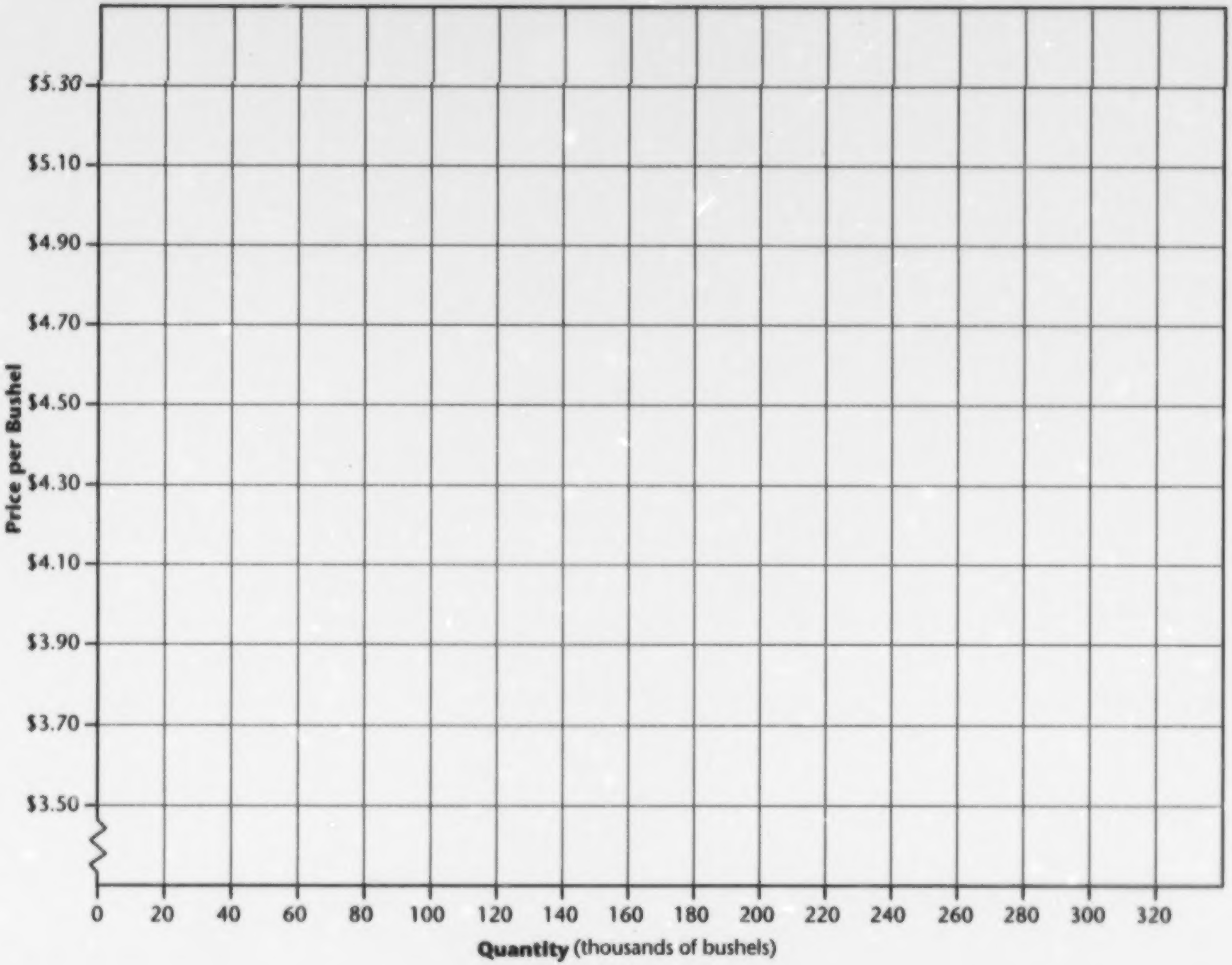
Score Sheet for *A Market in Wheat*

Name ______________________________ Class ______________

Circle one: Buyer Seller

	Transaction Number	Price per Bushel		Dollar Worth of 10 Bushels		Gain (+)	Loss (–)	Profit (gain minus loss)
		On Card	In Transaction	On Card	In Transaction			
ROUND 1	1							
	2							
	3							
	4							
	TOTAL FOR ROUND 1							
ROUND 2	1							
	2							
	3							
	4							
	TOTAL FOR ROUND 2							
ROUND 3	1							
	2							
	3							
	4							
	TOTAL FOR ROUND 3							
ROUND 4	1							
	2							
	3							
	4							
	TOTAL FOR ROUND 4							
ROUND 5	1							
	2							
	3							
	4							
	TOTAL FOR ROUND 5							
	GRAND TOTAL							

Wheat Supply and Demand



HANDOUT 2.4

Supply Schedule

In the following table, the supply schedule in the third column = cumulative number of bushels of wheat available for sale at the price indicated or at a higher price.

Price	No. of Sellers Willing to Sell 10 Bushels of Wheat at the Price Indicated or at a Higher Price	Supply Schedule
$3.50	4 sellers (= 40 bushels)	40
3.70	6 sellers (= 60 bushels)	100
3.90	6 sellers (= 60 bushels)	160
4.10	4 sellers (= 40 bushels)	200
4.30	4 sellers (= 40 bushels)	240
4.50	2 sellers (= 20 bushels)	260
4.70	2 sellers (= 20 bushels)	280
4.90	2 sellers (= 20 bushels)	300
5.10	2 sellers (= 20 bushels)	320

Demand Schedule

In the following table, the demand schedule in the third column = cumulative number of bushels of wheat buyers would be willing and able to buy at the price indicated or at a lower price.

Price	No. of Buyers Willing to Buy 10 Bushels of Wheat at the Price Indicated or at a Lower Price	Demand Schedule
$5.30	4 buyers (= 40 bushels)	40
5.10	4 buyers (= 40 bushels)	80
4.90	4 buyers (= 40 bushels)	120
4.70	4 buyers (= 40 bushels)	160
4.50	4 buyers (= 40 bushels)	200
4.30	4 buyers (= 40 bushels)	240
4.10	2 buyers (= 20 bushels)	260
3.90	2 buyers (= 20 bushels)	280
3.70	2 buyers (= 20 bushels)	300
3.50	2 buyers (= 20 bushels)	320

HANDOUT 2.5

Market Game Test

1. What does the term *supply* mean?

2. What does the term *demand* mean?

3. In your own words, explain the law of supply and demand, i.e. (1) the relationship between quantity supplied and price and (2) the relationship between quantity demanded and price.

4. Use the following terms to complete the sentences below. You will not need to use all of the terms.

   increase   remain unchanged   be less   decrease   be greater

   a. If everything else remains the same, the amount of wheat available for sale at a price of $4.90 per bushel would probably ____________________ than the amount available for sale at a price of $3.90 per bushel.

   b. However, the demand for wheat would ____________________ at $4.90 than at $3.90 per bushel.

   c. All things being equal, if less wheat were demanded then the prices charged for wheat would probably ____________________ .

   d. If the amount of wheat for sale doubled and the amount of wheat people were willing to buy doubled, the price would probably ____________________ .

HANDOUT 2.5 **ANSWER KEY**
Market Game Test

1. What does the term *supply* mean?

   The amount of a good or service that would be offered for sale at various prices over a given period of time.

2. What does the term *demand* mean?

   The amount of a good or service that buyers would be willing and able to purchase at various prices over a given period of time.

3. In your own words, explain the law of supply and demand, i.e. (1) the relationship between quantity supplied and price and (2) the relationship between quantity demanded and price.

   Assuming other conditions remain unchanged, when price increases, the quantity demanded decreases, and when price decreases, the quantity demanded increases; when prices rise, the quantity supplied increases, and when prices fall, the quantity supplied decreases.

4. Use the following terms to complete the sentences below. You will not need to use all of the terms.

   increase remain unchanged be less decrease be greater

   a. If everything else remains the same, the amount of wheat available for sale at a price of $4.90 per bushel would probably __**be greater**__ than the amount available for sale at a price of $3.90 per bushel.

   b. However, the demand for wheat would __**be less**__ at $4.90 than at $3.90 per bushel.

   c. All things being equal, if less wheat were demanded then the prices charged for wheat would probably __**decrease**__ .

   d. If the amount of wheat for sale doubled and the amount of wheat people were willing to buy doubled, the price would probably __**remain unchanged**__ .

UNIT 2, LESSON 2

The Law of Demand

Introduction and Description

In this lesson, students learn about the law of demand. They first learn that a demand curve is downsloping, and then they analyze why it is downsloping. Finally, they find out which factors other than the price of a product can shift the demand curve for that product. Diagrams are essential for analyzing changes in demand and changes in quantity demanded, but manipulating diagrams is not enough. Students must understand the actual behavior that is illustrated by a demand curve.

Objectives

1. Describe and analyze what demand is and why consumers buy more of a good or service when the price is lower.
2. Differentiate between a *change in demand* and a *change in quantity demanded.*
3. List and explain the determinants of demand.
4. Under specific conditions, determine in which direction a demand curve should shift.
5. Define and distinguish between the income and substitution effects.
6. Define *consumer surplus,* and analyze why markets maximize consumer surplus.
7. Define *diminishing marginal utility,* and explain how the law of diminishing marginal utility affects the behavior of consumers in a market economy.

Time Required

- Two class periods

Materials

1. Activities 13, 14, and 15
2. Visuals 2.2 and 2.3

Procedure

1. Tell the students that the law of demand describes the behavior of consumers. To illustrate this law, you are going to sell an "A" on the next test. Each student will submit a sealed bid. After you receive the bids, develop a demand curve with them. Arrange the bids from the highest to the lowest. In developing the demand curve, point out that the bids are cumulative. That is, a person willing to pay $50 is also willing to pay $25. Develop the demand curve on the chalkboard, and ask students to describe the behavior of consumers in relation to price and quantity demanded.
2. Use Visual 2.2 to illustrate the difference between a change in demand and a change in quantity demanded. A movement from A to B is a change in quantity demanded. This movement along the curve is caused by a change in the price of the product. Only a change in the price of Greebes will cause a change in the quantity of Greebes demanded. A shift of the curve is caused by factors other than the price of Greebes.
3. Still using Visual 2.2, explain the reason a demand curve shifts. An increase in demand means people are willing and able to buy more at each price; a decrease in demand means people are willing and able to buy less at each price. A movement from D_1 to D_2 is an increase in demand. A movement from D_1 to D_3 is a decrease in demand.
4. Now use Visual 2.3 to discuss the determinants of demand. Give examples in each category.
    1. Change in consumer tastes
    2. Change in the number of buyers
    3. Change in consumer incomes
    4. Change in the prices of complementary and substitute goods
    5. Change in consumer expectations
5. Have the students complete Activity 13, and discuss it.
6. Have the students complete Activity 14, which presents two equivalent ways of expressing demand and distinguishes between changes in the demand curve and

LESSON 2 continued

movements along the curve. Be sure to point out that the demand price is the maximum price consumers would be willing to pay. Of course, they would be willing to pay a lower price than this maximum price.

7. Give a lecture on the substitution and income effects, which explain why a demand curve is downsloping.

8. Give a brief lecture on *diminishing marginal utility*. Also emphasize *consumer surplus*, which is the difference between what the amount of a good or service purchased is worth to the consumer and how much the consumer had to pay for the good in the market. Consumer surplus benefits consumers, and this is a major reason that markets benefit consumers.

9. Now illustrate diminishing marginal utility with a simulation such as the following. You can use any food in such a simulation.

   Select one student volunteer. Place a dozen doughnuts (or other food items) in front of the student. Tell the student that you will ask him or her to evaluate the utility gained from his or her first doughnut. (You might want to start with a scale from 0 to 100 where 100 is the highest satisfaction.) Have the student eat the first doughnut and get a rating of utility gained from that doughnut. Keep track of his or her consumption on the chalkboard with a table with a column labeled "Quantity of Doughnuts" and a column labeled "Total Utility."

   Now have the student eat a second doughnut. Add the utility gained from this doughnut to the utility from the first and place in the "Total Utility" column. Continue until the student refuses to eat another doughnut; this will be the point where negative marginal utility sets in.

   Review the "Total Utility" column. Note the increasing total, but at a decreasing rate. Draw this curve on the board.

   Place a third column on the table, and label it "Marginal Utility." Review marginal utility. Calculate marginal utility for the second doughnut, then for the third. What happens? Emphasize the finding that with one more unit; the marginal utility decreases. Continue to calculate until you reach the point where the student refused to eat one more. Ask him or her if it would be fair to say that if forced to eat another doughnut, the utility "gained" might be negative. Use a negative number to add to "Total Utility"; then compute the marginal utility for that last forced doughnut.

   With the table still on the board, repeat: "As more is consumed, the marginal utility is smaller." Ask how this student could increase his or her marginal utility of doughnuts. (Eat fewer—show the marginal utility of four compared to the marginal utility of three doughnuts).

10. Now have the students complete Activity 15 and discuss it.

ACTIVITY 13 **ANSWER KEY**
Reasons for Changes in Demand

Part A.

1. **Price of Beef to Rise in June**
   Demand **increase** Curve **D**

2. **Millions of Immigrants Swell U.S. Population**
   Demand **increase** Curve **E**

3. **Pork Prices Drop**
   Demand **decrease** Curve **D**

4. **Surgeon General Warns That Eating Beef Can Be Hazardous to Health**
   Demand **decrease** Curve **C**

5. **Beef Prices Fall; Consumers Buy More**
   Demand **no change** Curve **C**
   (It's an increase in quantity demanded.)

6. **Real Income for Americans Drops Third Month in Row**
   (Beef is considered a normal good.)
   Demand **decrease** Curve **B**

7. **Charcoal Shortage Threatens Memorial Day Cookouts**
   Demand **decrease** Curve **A**

8. **Nationwide Fad: The Disco-Burger**
   Demand **increase** Curve **B**

Part B.

1 A change in consumer expectations

4,8 A change in consumer tastes

2 A change in the number of consumers in the market

6 A change in income

3 A change in the price of a substitute good

7 A change in the price of a complementary good

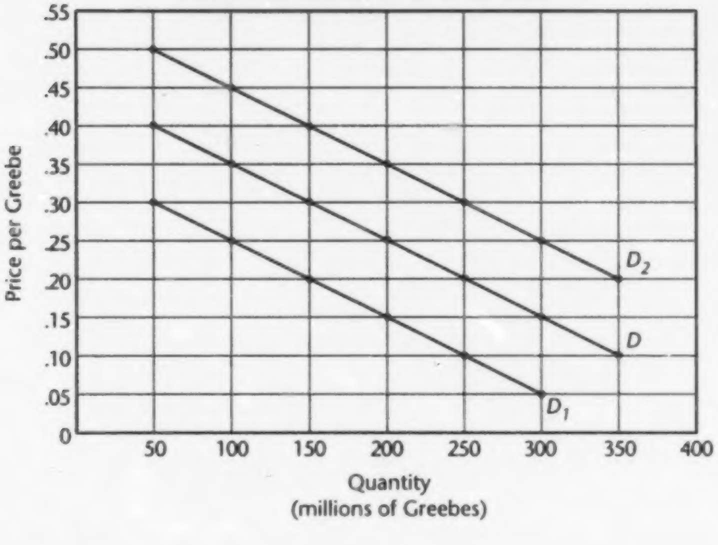
ACTIVITY 14 **ANSWER KEY**
Demand Curves, Moves Along Demand Curves, and Shifts in Demand Curves

Below is a table showing the market demand for Greebes, a hypothetical product introduced to spare you the confusion of real-world associations. Study the data in the table, and plot the demand for Greebes on the axes provided below. Label the demand curve *D*, and answer the questions that follow.

Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.10	350
.15	300
.20	250
.25	200
.30	150
.35	100
.40	50

Plotting Demand for Greebes



Part A.
Fill in the answer blanks or cross out the incorrect words in parentheses.

The data for demand curve *D* indicate that at a price of $.30 per Greebe, buyers would be willing to buy **150** million Greebes. Other things constant, if the price of Greebes increased to $.40 per Greebe, buyers would be willing to buy **50** million Greebes. Such a change would be a decrease in *(~~demand~~/quantity demanded)*. Other things constant, if the price of Greebes decreased to $.20, buyers would be willing to buy **250** million Greebes. Such a change would be called an increase in *(~~demand~~/quantity demanded)*.

ACTIVITY 14 ANSWER KEY continued

Now, to take another example, let's suppose that there is a dramatic increase in federal income tax rates that reduces the disposable income of Greebe buyers. This change in the *ceteris paribus* (all else being equal) conditions underlying the original demand for Greebes will result in a decrease in demand, and we would have a new set of data, such as that shown in the table *Decrease in the Demand for Greebes*. Study the data in the new table, and plot the new demand curve for Greebes on the axes, *Plotting Demand for Greebes*. Label the new demand curve D_1 and answer the questions that follow.

Decrease in the Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.05	300
.10	250
.15	200
.20	150
.25	100
.30	50

Comparing the new demand curve (D_1) with the old demand curve (D), we can say that a decrease in the demand for Greebes results in a shift of the demand curve to the *(~~right~~/left)*.

Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(smaller/~~larger~~)* quantity, and at each of the possible quantities shown, buyers are willing to offer a *(~~higher~~/lower)* maximum price.

Now, let's suppose that there is a dramatic increase in people's "taste" for Greebes. This change in the *ceteris paribus* conditions underlying the original demand for Greebes will result in an increase in demand, and we would have a new set of data such as that shown in the table *Increase in the Demand for Greebes*. Study the data in the new table, and plot this demand for Greebes on the axes. Label the new demand curve D_2 and answer the questions that follow.

Increase in the Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.20	350
.25	300
.30	250
.35	200
.40	150
.45	100
.50	50

Comparing the new demand curve (D_2) with the old demand curve (D), we can say that an increase in the demand for Greebes results in a shift of the demand curve to the *(right/~~left~~)*.

Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(~~smaller~~/larger)* quantity, and at each of the possible quantities shown, buyers are willing to offer a *(higher/~~lower~~)* maximum price.

ACTIVITY 14 ANSWER KEY continued

Part B.

Now, the dog work over, see if you have the point by circling the letter of the answer you think is the one best alternative in each of the following multiple-choice questions.

1. Other things constant, which of the following would *not* cause a change in the demand (shift in the demand curve) for mopeds?

   a. A decrease in consumer incomes.

   [✓ b.] A decrease in the price of mopeds.

   c. An increase in the price of bicycles.

   d. An increase in people's tastes for mopeds.

2. "Rising oil prices have caused a sharp decrease in the demand for oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes this quotation:

   a. The quotation is correct—an increase in price always causes a decrease in "demand."

   b. The quotation is incorrect—an increase in price always causes an increase in "demand," not a decrease in "demand."

   [✓ c.] The quotation is incorrect—an increase in price causes a decrease in the "quantity demanded," not a decrease in "demand."

   d. The quotation is incorrect—an increase in price causes an increase in the "quantity demanded," not a decrease in "demand."

3. "As the price of domestic automobiles has inched upward, customers have found foreign autos to be a better bargain. Consequently, domestic auto sales have been slipping and foreign auto sales have been moving briskly." Using only the information in this quotation and assuming everything else constant, which of the following best describes this statement?

   a. A shift in the demand curves for both domestic and foreign automobiles.

   b. A movement along the demand curves for both foreign and domestic automobiles.

   [✓ c.] A movement along the demand curve for domestic autos **[higher price, less quantity demanded]** and a shift in the demand curve for foreign autos **[change in underlying conditions (price of domestic autos)]**.

   d. A shift in the demand curve for domestic autos, a movement along the demand curve for foreign autos.

4. A fellow student is heard to say the following: "Economic markets are like a perpetual seesaw. If demand rises, the price rises; if price rises, then demand will fall; if demand falls, price will fall; if price falls, demand will rise ... and so on forever." Dispel your friend's obvious confusion (in no more than one short paragraph) below.
   The student is confusing a change in "demand" (shift in the curve) with a change in "quantity demanded" (move along the curve).
   The second phrase, "If price rises, then demand will fall," is wrong—the quantity demanded will fall, and since this is not a change in demand, the rest of the statement does not follow.

ACTIVITY 15 **ANSWER KEY**
Why Is a Demand Curve Downsloping? The Law of Diminishing Marginal Utility

To most people, the law of demand is obvious. Consumers buy more at a lower price and less at a higher price. Economists, however, go beyond describing the combined demand of all consumers in a market. To explain why a demand curve is downsloping or negatively sloped, they focus on the demand curve of a single consumer.

The *total utility* of a quantity of goods and services to a consumer can be represented by the maximum amount of money he or she is willing to give in exchange for them. The *marginal utility* of a good or service to a consumer (measured in money terms) is the maximum amount of money he or she is willing to pay for one more unit of the good or service. With these definitions, we can now state a simple idea about consumer tastes. The more of a good a consumer has, the less will be the marginal utility of an additional unit. The exercise below illustrates how economists use the law of diminishing marginal utility to derive a negatively sloped demand curve.

Part A.
The table *Marginal Utility of Dress Purchases* presents data on Dolores' evaluation of different quantities of dresses.

1. Use these data to compute the marginal utility of each dress.

2. The optimal purchase rule says to buy more dresses as long as the marginal utility of the next dress exceeds the price of the dress. According to this rule, how many dresses should Dolores buy if they cost

$90 each? **2**

$60 each? **4**

$40 each? **5**

Marginal Utility of Dress Purchases

Dresses	Total Utility	Marginal Utility
0	$0	
		$110
1	$110	
		$100
2	$210	
		$80
3	$290	
		$ **70**
4	$360	
		$ **50**
5	$410	
		$ **30**
6	$440	
		$ **20**
7	$460	

ACTIVITY 15 ANSWER KEY continued

3. Now, fill in the blank columns of the table *Marginal Utility of Dress Purchases at Three Prices* to compute the difference between total utility and total expenditures for each price. Total utility has been taken from the table *Marginal Utility of Dress Purchases*. What quantity maximizes the difference between total utility and total expenditures when price equals

$90? **2**

$60? **4**

$40? **5**

Marginal Utility of Dress Purchases at Three Prices

		Price=$90		Price=$60		Price=$40	
Total Utility	Dresses	Total Expenditure	Difference*	Total Exp.	Diff.*	Total Exp.	Diff.*
110	1	$90	$20	$60	$50	$40	$70
210	2	$180	**$30**	$120	**$90**	$80	**$130**
290	3	$270	**$20**	$180	**$110**	$120	**$170**
360	4	$360	**0**	$240	**$120**	$160	**$200**
410	5	$450	**-$40**	$300	**$110**	$200	**$210**
440	6	$540	**-$100**	$360	**$80**	$240	**$200**
460	7	$630	**-$170**	$420	**$40**	$280	**$180**

*Differences between total utility and total expenditures

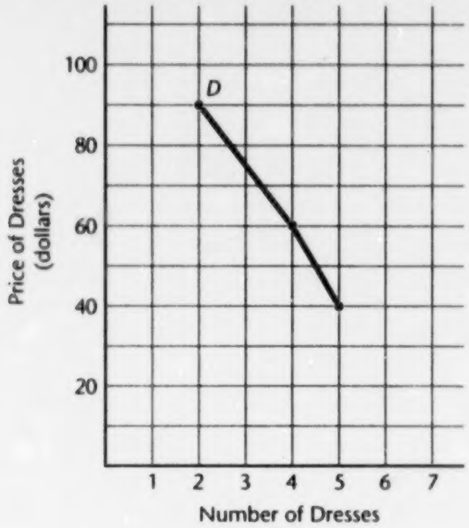
4. Total utility is the maximum amount Dolores would pay for various quantities of dresses. The difference between what she would be willing to pay and what she has to pay is called consumer surplus. How do the quantities determined using the optimal purchase rule in question 1 compare with those determined by maximizing consumer surplus in question 3?

Consumer quantities are the same.

5. Use the information in the table *Marginal Utility of Dress Purchases* to plot Dolores' demand curve for dresses in *Plotting Marginal Utility of Dress Purchases* on the following page. Is your demand curve consistent with your answers to questions 2 and 3? (It should be.)

ACTIVITY 15 ANSWER KEY continued

Figure 1
Plotting Marginal Utility of Dress Purchases



Part B.
Consider the following information on Joel's total utility for CD purchases, and then circle the letters of each correct answer of the questions that follow.

Total Utility of CDs

Number of CDs	Total Utility
1	$25
2	$45
3	$63
4	$78
5	$90
6	$100
7	$106
8	$110

1. What marginal utility is associated with the purchase of the third CD?
   [✓ a.] $18 **$63 – $45 = $18**
   b. $21
   c. $45
   d. $63

2. What is Joel's consumer surplus if he purchases three CDs at $11 apiece?
   [✓ a.] $30 **$63 – $33 = $30**
   b. $33
   c. $63
   d. $96

ACTIVITY 15 ANSWER KEY continued

3. What would happen to Joel's consumer surplus if he purchased an additional CD at $11?
    - a. Consumer surplus declines by $11.
    - b. Consumer surplus increases by $11.
    - c. Consumer surplus increases by $15. **$78 – $44 = $34**
    - [✓ d.] Consumer surplus increases by $4. **$34 – $30 = $4**

4. How many CDs should Joel buy when they cost $11 apiece?
    - a. 0
    - b. 3 **Consumer surplus is maximized** **$78 – $44 = $34**
    - [✓ c.] 5 **at 5. You can also compare the** **$90 – $55 = $35**
    - d. 7 **price to marginal utility** **$100 – $66 = $34**

5. What is Joel's consumer surplus at the optimal number of CD purchases?
    - [✓ a.] $35
    - b. $55
    - c. $79
    - d. $100

6. If CDs go on sale and their price drops to $8, how many CDs do you expect Joel to buy?
    - a. 5
    - [✓ b.] 6 **Consumer surplus is maximized at 6 CD's**
    - c. 7
    - d. 8

UNIT 2, LESSON 3

Understanding Supply

Introduction and Description

Prices are determined by demand and supply. This lesson examines the factors that affect supply; they are called the determinants of supply. Students should also understand the difference between changes in supply and changes in quantity supplied. Students may have more trouble understanding supply than demand. Supply describes the behavior of producers, and students have had little experience as producers. Of course, they have a lot of experience as consumers.

Objectives

1. Describe the behavior of sellers in a competitive market.
2. Differentiate between a *change in supply* and a *change in quantity supplied*.
3. List and explain the determinants of supply.
4. Under specific conditions, determine in which direction a supply curve should shift.

Time Required

- One and one-half class periods

Materials

1. Activities 16 and 17
2. Visuals 2.4 and 2.5

Procedure:

1. Tell the students that supply describes the behavior of sellers. To illustrate this, you are willing to buy push-ups from students. (WARNING: This activity may not work in some AP classes if all students will do push-ups for one extra credit point.)
   a. Tell the students you will give them one extra credit point for 20 push-ups. Ask how many will take your offer. Then make them do the push-ups. If a student says that he or she is injured, tell the student, "tough" or "too bad." You pay for performance. This is how markets work.
   b. Repeat the procedure for two extra credit points. The ones who did them for one point will want to do them for two. Let them. This will show them more clearly that a supply curve is cumulative. Businesses that will sell a product for $1 will also sell it for $2. In any market, some producers have producer surplus.
   c. Repeat the procedure for three extra credit points.
   d. Construct a supply curve with push-ups (quantity) on the horizontal axis and points (price) on the vertical axis.
   e. Now ask the students why they would sell more push-ups at a higher price. Point out that price is an incentive to producers to produce what consumers want to buy.
2. Use Visual 2.4 to illustrate the difference between a change in supply and a change in quantity supplied. A movement from A to B illustrates a change in quantity supplied. This movement along the curve is caused by a change in the price of a good or service. In other words, only an increase in price can change the quantity of Greebes supplied.
3. Now illustrate a shift in supply. A shift from S_1 to S_3 is a decrease in supply. Less is supplied at each price. A shift from S_1 to S_2 is an increase in supply. More is supplied at each price.
4. Now use Visual 2.5 to discuss the determinants of supply. Give examples of each one. Point out that most determinants of supply relate to costs. Any factor that increases costs decreases supply. Any factor that decreases costs increases supply. The determinants of supply are:
   1. Change in resource prices or input
   2. Change in technology
   3. Change in taxes and subsidies
   4. Change in the prices of other goods
   5. Change in producer expectations
   6. Change in the number of suppliers

LESSON 3 continued

5. Have the students complete Activity 16. Discuss their answers.
6. Have the students complete Activity 17, which distinguishes between changes in the supply curve and movements along the curve. Emphasize that the "supply price" is the minimum price that sellers would be willing to accept for any given quantity. Of course, they would be willing to accept a higher price than the minimum. Discuss the answers to the worksheet.

ACTIVITY 16 **ANSWER KEY**
Reasons for Changes in Supply

Part A.

1. **Auto Workers' Union Agrees to Wage and Fringe Cuts**

   Supply **increase** Curve **D**

2. **New Robot Technology Increases Efficiency**

   Supply **increase** Curve **E**

3. **Nationwide Auto Strike Began at Midnight**

   Supply **decrease** Curve **D**

4. **New Auto Import Quotas Reduce Flow of Foreign Cars**

   Supply **decrease** Curve **C**

5. **Cost of Steel Rises**

   Supply **decrease** Curve **B**

6. **Auto Producer Goes Bankrupt, Closes Operation**

   Supply **decrease** Curve **A**

7. **Buyers Reject New Models**

   Supply **no change** Curve **A** **It's a decrease in demand and a decrease in quantity supplied.**

Part B.

1,5 A change in the cost of production

2 A change in technology **Students might also classify this as a change of cost.**

3,6 Natural disaster/other event that causes decrease in production

4 Government policies

ACTIVITY 17 **ANSWER KEY**
Supply Curves, Moves Along Supply Curves, and Shifts in Supply Curves

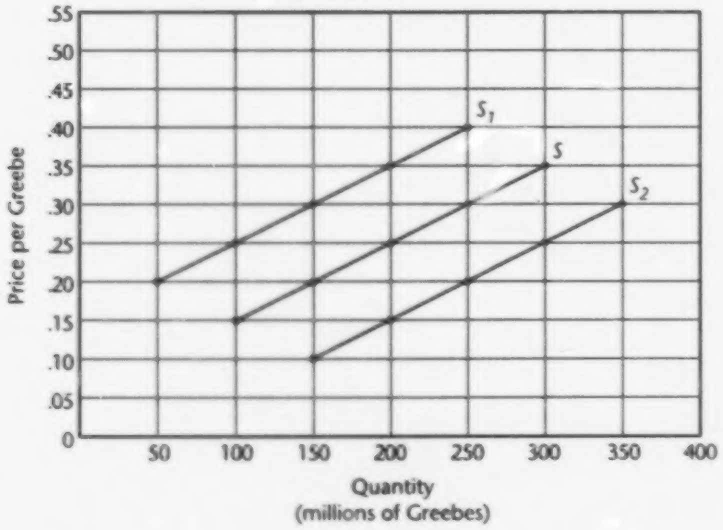
Long-run competitive market supply curves usually slope "up to the right," but not always. If each firm in the market could expand its output with a constant marginal cost, and if new firms could enter the market with exactly the same costs as the firms already in the market, the long-run supply curve would be a "perfectly elastic" horizontal line, but this is not likely in very many cases. Typically, firms in a competitive market experience increases in their marginal cost as output expands beyond a certain point, and firms entering a competitive market as price rises usually have higher costs than firms already in the market at lower prices. (If marginal cost continues to fall as output expands, only one firm would ever be in the market and, by definition, there could not be a competitive market supply curve.)

In this Activity, and those that follow, we will assume that the long-run supply curve of Greebes is "typically" upward sloping. Study the data in the table *Supply of Greebes,* and plot the supply of Greebes on the axes provided. Label the supply curve *S.* and answer the questions that follow.

Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.15	100
.20	150
.25	200
.30	250
.35	300

Plotting Supply of Greebes



ACTIVITY 17 ANSWER KEY continued

Part A.

Fill in the answer blanks or cross out the incorrect words in parentheses.

The data for supply curve *S* indicate that at a price of $.25 per Greebe, suppliers would be willing to offer __**200**__ million Greebes. Other things constant, if the price of Greebes increased to $.30 per Greebe, suppliers would be willing to offer __**250**__ million Greebes. Such a change would be an increase in *(~~supply~~/quantity supplied)*.

Other things constant, if the price of Greebes decreased to $.20 per Greebe, suppliers would be willing to offer __**150**__ million Greebes. Such a change would be called a decrease in *(~~supply~~/quantity supplied)*.

Now let's suppose that there is a dramatic increase in the price of several of the raw materials used in making Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in a decrease in supply, and we would have a new set of data, such as that shown in the table *Decrease in Supply of Greebes*. Study the data in the new table, and plot this supply of Greebes on the axes. Label the new supply curve S_1 and answer the questions that follow.

Decrease in Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200
.40	250

Comparing the new supply curve (S_1) with the old supply curve (S), we can say that a decrease in the supply of Greebes results in a shift of the supply curve to the *(~~right~~/left)*.

Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a *(smaller/~~larger~~)* quantity, and at each of the possible quantities shown, suppliers are willing to accept a *(higher/~~lower~~)* minimum price.

Now, to take another example, let's suppose that there is a dramatic decrease in the price of several of the raw materials used in making Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in an increase in supply, and we would have a new set of data, such as that shown in the table *Increase in Supply of Greebes*. Study the data in the new table, and plot this supply of Greebes on the axes. Label the new supply curve S_2 and answer the questions that follow.

Increase in Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.10	150
.15	200
.20	250
.25	300
.30	350

Comparing the new supply curve (S_2) with the old supply curve (S), we can say that an increase in the supply of Greebes results in a shift of the supply curve to the *(right/~~left~~)*.

ACTIVITY 17 ANSWER KEY continued

Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a *(~~smaller~~/larger)* quantity, and at each of the possible quantities shown, suppliers are willing to accept a *(~~higher~~/lower)* minimum price.

Part B.

Now, the dog work over, see if you have the point by circling the letter of the answer you think is the one best alternative in each of the following multiple-choice questions.

1. Other things constant, which of the following would *not* cause a change in the long-run supply of beef?

   [✓ a.] A decrease in the price of beef.

   b. A decrease in the price of cattle feed.

   c. An increase in the price of cattle feed.

   d. An increase in the cost of transporting cattle to market.

2. "Falling oil prices have caused a sharp decrease in the supply of oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes this quotation.

   a. The quotation is correct—a decrease in price always causes a decrease in "supply."

   b. The quotation is incorrect—a decrease in price always causes an increase in "supply," not a decrease in "supply."

   c. The quotation is incorrect—a decrease in price causes an increase in the "quantity supplied," not a decrease in "supply."

   [✓ d.] The quotation is incorrect—a decrease in price causes a decrease in the "quantity supplied," not a decrease in "supply."

UNIT 2, LESSON 4

Equilibrium Price, Equilibrium Quantity, and the Interrelation of Markets

Introduction and Description

The forces of supply and demand work to establish a price at which the quantity of goods and services people will buy is equal to the quantity suppliers will provide. Activity 18 illustrates this point. If supply or demand changes, equilibrium price and quantity change. Activity 19 drives this point home. Finally, the equilibrium price and quantity of a good or service established by supply and demand affect the equilibrium price and quantity in other markets. Market prices determine what to produce, how to produce, and for whom to produce. This is an important point, which is illustrated by Activities 19 and 20.

Objectives

1. Define *equilibrium price and quantity*.
2. Determine the equilibrium price and quantity when given the demand for and supply of a good or service.
3. Explain why the price of a good or service and the amount bought and sold in a competitive market will be the equilibrium price and quantity.
4. Predict the effects of changes in supply and demand on equilibrium price and quantity and on the price of substitute and complementary goods.
5. Given changes in supply and demand, explain which curve has shifted and why.
6. Analyze how buyers and sellers respond to incentives provided by changing market conditions.
7. Explain how markets provide information that enables consumers and producers to allocate resources more efficiently.
8. Analyze how markets act as rationing devices and how markets allocate resources.

Time Required

- Two class periods

Materials

1. Activities 18, 19, and 20
2. Visuals 2.6 and 2.7

Procedure

1. Before getting to the graphs, it is helpful to try to define *equilibrium*. Equilibrium is a state of balance between opposing forces. It occurs because everywhere else there is a state of imbalance or disequilibrium. In markets, equilibrium is usually a temporary condition. You might illustrate this by putting a ball in a bowl. It will come to rest. Then hit the bowl, and the ball will move and come to rest again. Hitting the bowl is like a shift in demand or supply. However, the difference is that equilibrium occurs at different levels in supply and demand analysis. Each resting place is a different setting, depending on market conditions.
2. Use Visual 2.6 to show how markets reach equilibrium.
   a. What if the market price were $4? There would be a surplus of 800 Greebes. How would sellers get rid of the surplus? They would lower the price until all the Greebes offered for sale were sold. The lower price is an incentive that brings more buyers into the market. All the Greebes would be sold at $3, the equilibrium price.

   b. What if the market price were $2? Buyers would demand 800 more Greebes than sellers are willing to sell. Which buyers will get the Greebes? The ones who will pay more. The higher price is an incentive that brings more sellers into the market. Once again at $3 the number of Greebes offered for sale

LESSON 4 continued

in a time period is equal to the number of Greebes consumers are willing and able to buy.

C. Only at a price of $3 is the number of Greebes sellers are willing and able to sell equal to the number of Greebes consumers are willing and able to buy. This is why the equilibrium price of Greebes is $3 and the equilibrium quantity of Greebes is 1,000.

3. Have the students complete Activity 18 and discuss the answers.

4. Now use Visual 2.7 to illustrate shifts in demand and supply. Each shift changes both the equilibrium price and quantity.
   a. Graph A shows an increase in demand, causing an increase in price, which causes an increase in quantity supplied.
   b. Graph B shows a decrease in demand, causing a decrease in price, which causes a decrease in quantity supplied.
   c. Graph C shows an increase in supply, causing a decrease in price, which causes an increase in quantity demanded.
   d. Graph D shows a decrease in supply, causing an increase in price, which causes a decrease in quantity demanded.
   e. In each case, students should distinguish the difference between a shift and a price effect (i.e., change in quantity demanded or quantity supplied).

5. Have the students complete Activity 19 and discuss the answers. Parts B and C are more difficult than Part A. It might be a good idea to go over the first few graphs in Part B to show the students how interactive markets work.

6. Now it's time for Activity 20, which students will find difficult. However, the Activity shows how markets allocate resources. The Activity illustrates how the apparently chaotic billions of individual choices that are made in a market result in an orderly allocation of scarce resources. In this Activity, students should ignore "feedback" effects, which means they should *shift only one curve in each market.* Long-run supply curves are shown so the supply curve shifts only if there are changes in underlying conditions. A change in the equilibrium price and quantity in one market may shift demand or supply in another market. The changes in the other markets are assumed *not* to feed back on Market 1 in this time period. Emphasis should be placed on changes in equilibrium quantity as well as changes in equilibrium price. Quantity changes will differ depending on what caused the price change, and quantity changes affect the demand for substitute and complementary goods. Here is the logic that underlies each case.

q.1. The increased productivity in potatoes results in an increase in supply. Potatoes and bread are substitutes for the consumer (both are starches) so the lower equilibrium price and larger equilibrium quantity of potatoes decrease the demand for bread. With less bread being sold, bakers require less wheat, and with less wheat being sold, farmers require less harvesting machinery, reducing those derived demands.

q.2. An increased demand for briefcases would result in a higher price and larger quantity of briefcases. This would increase the demand for leather and lead to an increase in its equilibrium price and quantity. The higher price of leather will increase resource costs and decrease the supply of another final product, shoes. Decreased production of shoes results in decreased derived demand for shoelaces and for shoelace packaging machinery.

q.3. The destruction of the coffee crop is a reduction in supply. Tea and coffee are probably substitutes for many consumers so the higher equilibrium price and smaller equilibrium quantity of coffee will increase the demand for tea. Assuming that more cream is used in coffee than in tea, this will reduce the demand for

LESSON 4 continued

cream and automatic coffee makers as well as their price and quantity.

q.4. The change in taste toward sport shirts will result in an increase in demand for sport shirts. This same change of taste will result in a decrease in the demand for dress shirts. The decline in the equilibrium quantity of dress shirts will result in a decrease in demand for both neckties and tie clips.

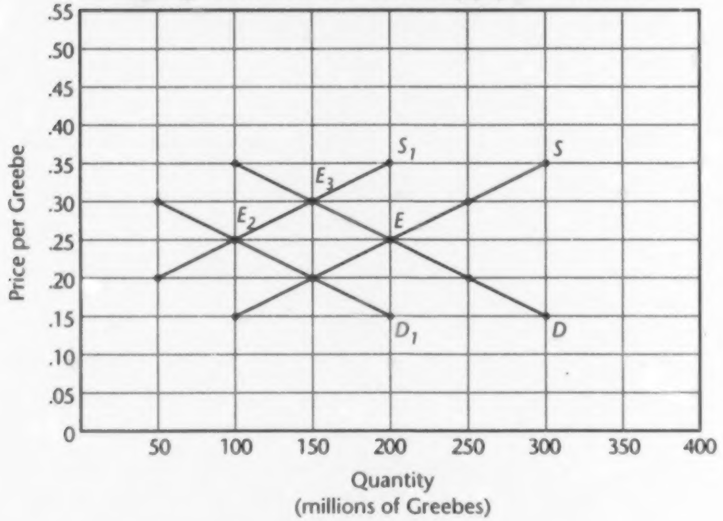
ACTIVITY 18 **ANSWER KEY**
Equilibrium Prices and Equilibrium Quantities

Below is a table showing the demand for Greebes and the supply of Greebes. Plot these data on the axes provided. Label the demand curve "D," and label the supply curve "S." Then answer the questions that follow.

Demand for and Supply of Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)	Quantity Supplied (millions of Greebes)
$.15	300	100
.20	250	150
.25	200	200
.30	150	250
.35	100	300

Plotting Demand for and Supply of Greebes



Fill in the answer blanks or cross out the incorrect words in parentheses.

1. Under these conditions, competitive market forces would tend to establish an equilibrium price of $ **.25** per Greebe and an equilibrium quantity of **200** million Greebes.

2. If the price currently prevailing on the market is $.30 per Greebe, buyers would want to buy **150** million Greebes and sellers would want to sell **250** million Greebes. Under these conditions, there would be a *(~~shortage~~/surplus)* of **100** million Greebes. Competitive market forces would tend to cause the price to *(~~increase~~/decrease)* to a price of $ **.25** per Greebe.

   At this new price, buyers would now want to buy **200** million Greebes, and

ACTIVITY 18 ANSWER KEY continued

sellers would now want to sell **200** million Greebes. Due to this change in *(price/~~underlying conditions~~)*, the *(~~demand~~/quantity demanded)* changed by **+50** million Greebes, and the *(~~supply~~/quantity supplied)* changed by **–50** million Greebes.

3. If the price currently prevailing on the market is $.20 per Greebe, buyers would want to buy **250** million Greebes and sellers would want to sell **150** million Greebes. Under these conditions, there would be a *(shortage/~~surplus~~)* of **100** million Greebes. Competitive market forces would tend to cause the price to *(increase/~~decrease~~)* to a price of $ **.25** per Greebe.

   At this new price, buyers would now want to buy **200** million Greebes, and sellers would now want to sell **200** million. Due to this change in *(price/~~underlying conditions~~)*, the *(~~demand~~/quantity demanded)* changed by **–50** million Greebes, and the *(~~supply~~/quantity supplied)* changed by **+50** million Greebes.

4. Now, suppose that a mysterious blight causes the supply schedule for Greebes to change to the following:

Change in Supply of Greebes

Price ($ per Greebe)	Quantity Supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200

Plot the new supply schedule on the axes *Plotting Demand for and Supply of Greebes* and label it S_1. Label the new equilibrium E_1. Under these conditions, competitive market forces would tend to establish an equilibrium price of $ **.30** per Greebe and an equilibrium quantity of **150** million Greebes.
Compared to the equilibrium price in question 1, we say that, due to this change in *(~~price~~/underlying conditions)* the *(supply/~~quantity supplied~~)* changed, and both the equilibrium price and the equilibrium quantity changed. The equilibrium price *(increased/~~decreased~~)* and the equilibrium quantity *(~~increased~~/decreased)*.

ACTIVITY 18 ANSWER KEY continued

5. Now with the supply schedule at S_1, suppose further that a sharp drop in people's incomes as the result of a nationwide depression causes the demand schedule to change to the following:

Change in Demand for Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)
$.15	200
.20	150
.25	100
.30	50

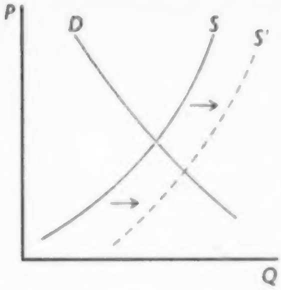
Plot the new demand schedule on *Plotting Demand for and Supply of Greebes* and label it D_1. Label the new equilibrium E_2. Under these conditions, with the supply schedule at S_1, competitive market forces would tend to establish an equilibrium price of $ **.25** per Greebe and an equilibrium quantity of **100** million Greebes. Compared to the equilibrium price in question 4, due to this change in *(~~price~~/underlying conditions)* the *(demand/~~quantity demanded~~)* changed. The equilibrium price *(~~increased~~/decreased)* and the equilibrium quantity *(~~increased~~/decreased)*.

6. If market conditions were represented by D_1 and S, the equilibrium price would be $ **.20** per Greebe, and the equilibrium quantity would be **150** million Greebes.

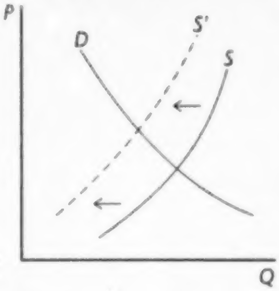
ACTIVITY 19 **ANSWER KEY**
Shifts in Supply and Demand

Part A.
After each situation, fill in the blank with the letter of the graph that illustrates the situation. You may use a graph more than once. The product being considered is jelly beans.

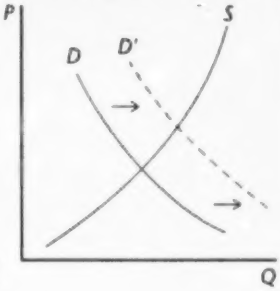
Jelly Beans
Supply and Demand A



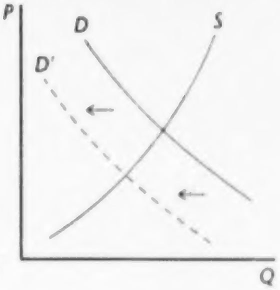
Jelly Beans
Supply and Demand B



Jelly Beans
Supply and Demand C



Jelly Beans
Supply and Demand D

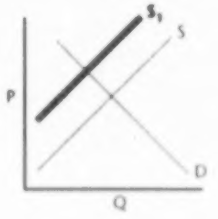


1. The price of sugar increases. **B**
2. The price of bubble gum, a close substitute for jelly beans, increases. **C**
Could also be B if the student says suppliers could produce gum instead of jelly beans.
3. A machine is invented that makes jelly beans at a lower cost. **A**
4. The government places a tax on foreign jelly beans that have a considerable share of the market. **B**
5. The price of soda pop, a complementary good for jelly beans, increases. **D**
6. Widespread prosperity allows people to buy more jelly beans. **C**

Part B.
Connecticut ships large amounts of apples to all parts of the United States by rail. Circle the words that show the effects on price and quantity for each situation, and complete the graphs below showing how a hurricane that destroys apples before they are picked in Connecticut might affect the price and quantity of:

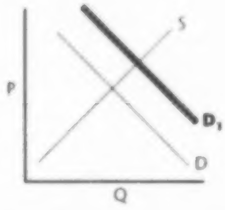
1. Apples in Boston

Price: [✓ Rises] Stays the same Falls
Quantity: Rises Stays the same [✓ Falls]



2. Land devoted to apple orchards in the state of Washington

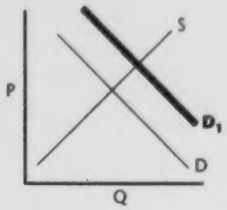
Price: [✓ Rises] Stays the same Falls
Quantity: [✓ Rises] Stays the same Falls



ACTIVITY 19 ANSWER KEY continued

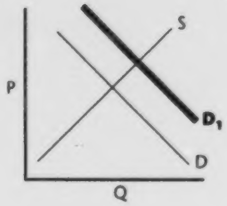
3. Apples grown in the state of Washington

Price: [✓ Rises] Stays the same Falls
Quantity: [✓ Rises] Stays the same Falls



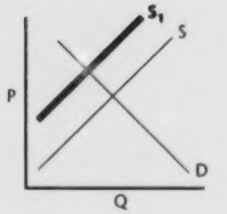
4. Pears

Price: [✓ Rises] Stays the same Falls
Quantity: [✓ Rises] Stays the same Falls



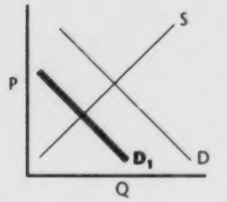
5. Apple pies

Price: [✓ Rises] Stays the same Falls
Quantity: Rises Stays the same [✓ Falls]



6. The wages of apple pickers in Connecticut

Price: Rises Stays the same [✓ Falls]
Quantity: Rises Stays the same [✓ Falls]



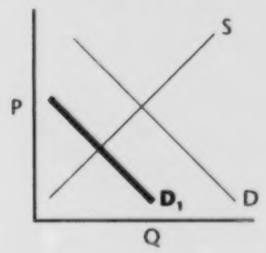
ACTIVITY 19 ANSWER KEY continued

Part C.

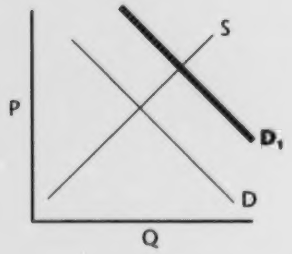
Read the following news story (based on an article in *Newsweek*, July 13, 1992) and use the graphs to show how the information in the story might affect various markets.

> Cancer researchers have reported that hair dyes may be a cause of cancer. Writing in *The Journal of Public Health*, researchers at the National Cancer Institute reported that women who dye their hair may increase their risk of lymphoma by 50 percent.

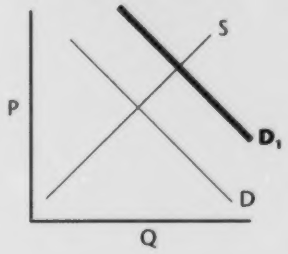
Hair dyes



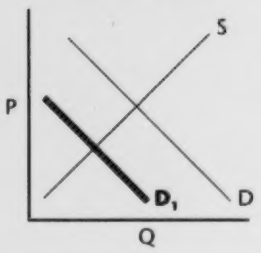
Wigs



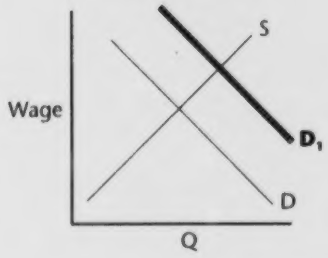
Plastic gloves



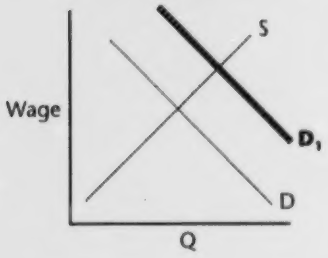
Beauticians



Wig makers



Plastic glove makers



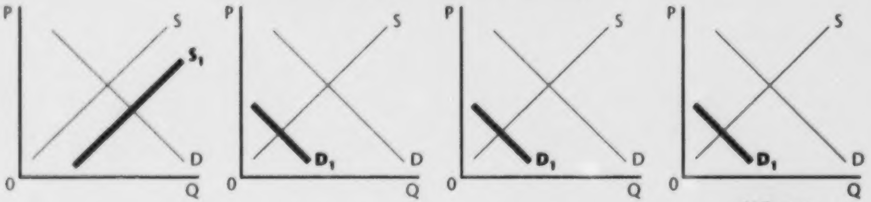
ACTIVITY 20 **ANSWER KEY**
How Markets Allocate Resources

The following questions refer to a group of related markets in the United States during a long period of time. Assume that the markets are perfectly competitive and that the supply-and-demand model is completely applicable. The diagrams show the supply and demand in each market *before* the assumed change occurs. Trace through the effects of the assumed change, *other things constant*. Work your way from left to right. Shift only one curve in each market.

For each market, draw whatever new supply or demand curves are needed, labeling each new curve S_1 or D_1. Then circle the correct symbol under each diagram (↑ for increase, — for unchanged, and ↓ for decrease). Remember to shift only one curve in each market.

1. Assume that a new fertilizer dramatically increases the number of potatoes that can be harvested with no additional labor or machinery. Also assume that this fertilizer does not affect wheat farming and that people are satisfied to eat either potatoes or bread made from wheat flour.

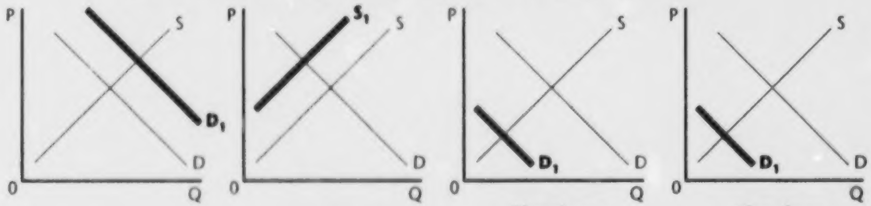
Effects of a New Fertilizer



	Potatoes	Bread	Wheat	Wheat harvesting machinery
Demand:	↑ [✓ —] ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Supply:	[✓ ↑] — ↓	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Equilibrium quantity:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]

2. Assume people's tastes change and there is an increase in the demand for briefcases and luggage made out of leather. How would this affect the leather market and related markets? Draw the new curves and circle the appropriate symbols in all four markets.

Effects of Increased Demand for Leather Goods

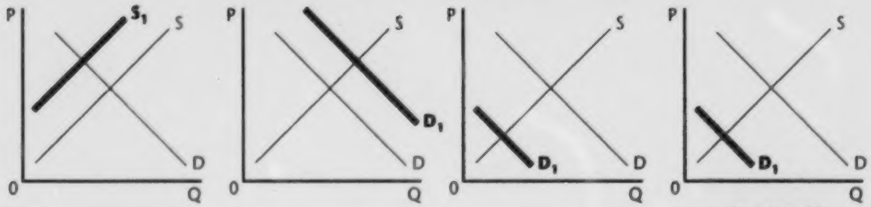


	Leather	Leather shoes	Shoelaces for leather shoes	Shoelace packaging machinery
Demand:	[✓ ↑] — ↓	↑ [✓ —] ↓	↑ — [✓ ↓]	↑ — [✓ ↓]
Supply:	↑ [✓ —] ↓	↑ — [✓ ↓]	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	[✓ ↑] — ↓	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]
Equilibrium quantity:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]

ACTIVITY 20 ANSWER KEY continued

3. Assume that a heavy frost destroys half the world's coffee crop and that people use more cream in coffee than they do in tea.

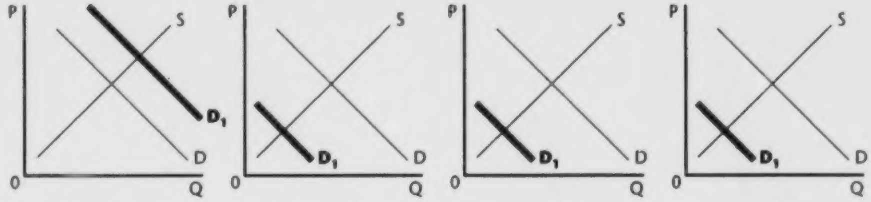
Effects of a Loss of Coffee Crop



	Coffee	Tea	Cream	Automatic coffee makers
Demand:	↑ [✓ —] ↓	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]
Supply:	↑ — [✓ ↓]	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	[✓ ↑] — ↓	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]
Equilibrium quantity:	↑ — [✓ ↓]	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]

4. Assume people's tastes change in favor of colored sports shirts, which are worn without neckties, and against white dress shirts, which are worn with neckties.

Effects of a Shift to Sports Shirts



	Sports shirts	Dress shirts	Neckties	Tie clasps
Demand:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Supply:	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Equilibrium quantity:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]

UNIT 2, LESSON 5

Elasticity of Demand and Supply

Introduction and Description

Knowledge of price elasticity of demand and supply helps students understand how businesses make pricing decisions and how governments make decisions on taxation. These exercises on elasticity become increasingly complex. To answer the elasticity questions on the AP exam, students should know the qualities that determine elasticity of demand and supply, how the total revenue method can be used to determine elasticity of demand, and how to calculate elasticity coefficients. Elasticity lends itself to complex application questions. A knowledge of the factors that determine elasticity may be more important than memorizing formulas.

Students should also understand elasticity of supply, particularly the idea that long-run supply is more elastic than short-run supply.

Objectives

1. Define *price elasticity of demand.*
2. Define *price elasticity of supply.*
3. Distinguish among *elastic, inelastic,* and *unit elastic demand.*
4. Explain the characteristics that tend to make demand more elastic or more inelastic.
5. Determine the prices at which a product has elastic or inelastic demand by observing how total revenue changes in response to changes in price.
6. Apply price elasticity of demand to economic problems.
7. Define and distinguish between a *normal good* and an *inferior good* using income elasticity of demand.
8. Explain the characteristics that make supply elastic or inelastic.
9. Analyze momentary, short-run, and long-run elasticity of supply.

Time Required

- Three class periods

Materials

1. Activities 21, 22, 23, and 24
2. Visual 2.8
3. Paper clip
4. Rubber band

Procedure

1. Remind the students that as price decreases, quantity demanded increases. But does it increase a lot or a little? If it increases a lot, we call it *elastic*. If it increases a little, it is *inelastic*. Later we will define "a lot" and "a little."
2. Illustrate this visually by dropping a tennis ball and a baseball. Elasticity is a measure of responsiveness to any stimulus. Dropping the ball is a stimulus just like a price change is a stimulus. A tennis ball bounces a lot. It is elastic. The baseball does not bounce much. It is inelastic. Price elasticity of demand is the response of quantity demanded to a change in price.
3. Give a lecture on the qualities that make demand elastic or inelastic.
   a. *Substitutability.* The more substitutes there are for the good, the greater the price elasticity of demand.
   b. *Proportion of income.* Low-priced goods, which require only a small portion of one's income, tend to be more inelastic than high-priced goods, which require a large portion of one's income.
   c. *Luxuries and necessities.* Luxuries tend to be elastic while necessities tend to be inelastic.
   d. *Time.* Consumers can respond to a price change more easily if they have more time. The greater the period of time, the greater the price elasticity of demand.
4. Have the students complete Activity 21 and discuss the answers.
5. Give a lecture on the total revenue test for

Jerry DeYoung, Riverbank High School, Riverbank, CA, made several contributions to this lesson, including the paper clip/rubber band demonstration.

price elasticity of demand. Because the relationship between price and quantity demanded is inverse, a total revenue test can be used to determine price elasticity of demand:

Price x quantity = total revenue.

a. If total revenue moves in the same direction as price, demand is price inelastic.

b. If total revenue moves in the same direction as quantity or inversely to price, demand is price elastic.

b. If total revenue remains the same as price increases, the demand is unit elastic.

6. The total revenue test itself is not a very intuitive concept, and students sometimes have difficulty remembering it. Try this demonstration to explain the concept. Holding the rubber band vertically, consider its top to be price and the bottom total revenue. Note that as you stretch the rubber band, price goes up while total revenue goes down. As you let go, price comes back down and total revenue goes up. They move in opposite directions (inversely), and a rubber band is *elastic*. Now hold the paper clip vertically and label the top price and bottom total revenue. Note that as the top (price) goes up, so does the bottom (total revenue) of the paper clip. As the top goes down, so does the bottom. They move in the same direction (directly), and a paper clip is *inelastic*. Once students have the big point about elasticity, it is important that they do not get the impression that the entire market demand curve for most products can be labeled elastic or inelastic. For most demand curves, elasticity varies at different points on the curve—more elastic at high prices and low quantities and more inelastic at low prices and high quantities. This is an important point with respect to some current examples such as gasoline.

7. Have the students complete Activity 22 and discuss the answers.

8. Now tell the students that it is time to apply the concept of elasticity of demand to gain insight into situations around them. Have the students complete Activity 23 and discuss it.

9. Finally, we must get more precise in our definition of price elasticity of demand. To do this, we use an elasticity coefficient.

   a. $$Ed = \frac{\text{\% change in quantity demanded}}{\text{\% change in price}}$$

   b. Now discuss the midpoint formula for calculating elasticity of demand.

   c. Always change the negative sign when calculating price elasticity of demand.

   d. Go over elasticity coefficients.
   E < 1 = inelastic
   E > 1 = elastic
   E = 1 = unit elastic

10. Have the students do question 1 of Activity 24 and discuss it.

11. Give a lecture on elasticity of supply using Visual 2.8. Emphasize that the greater the time period, the greater the price elasticity of supply. Because the relationship between price and quantity supplied is direct, the total revenue test will not work. Also, the sign will *not* have to be changed when calculating price elasticity of supply.

12. Have the students do question 2 of Activity 24 and discuss it.

13. Now give a lecture on income elasticity of demand. This shows the responsiveness of demand to changes in income.
The formula is:

$$Ei = \frac{\text{\% change in quantity demanded}}{\text{\% change in income}}$$

The formula actually measures a shift in demand in response to a change in income. In most cases, income elasticity of demand for goods is positive. These goods are called *normal goods*. In some cases, income elasticity of demand is negative. These goods are called *inferior goods*.

14. Do question 3 in Activity 24 and discuss the answers.

ACTIVITY 21 **ANSWER KEY**
What Is Price Elasticity of Demand?

Determine whether the demand for the following items is price elastic or inelastic. Write your answer on the line after the item. Then write the reasons for your answer.

1. Salt **Inelastic** Why? **It is a necessity, has few substitutes, and takes a small portion of a purchaser's budget.**

2. New cars **elastic** Why? **Used cars are a substitute, and a new car takes a large portion of a purchaser's budget. New cars may also be classified as a luxury.**

3. Pork chops **elastic** Why? **There are many substitutes, and meat takes a fairly large portion of a purchaser's food budget.**

4. European vacation trip **elastic** Why? **There are many other places to go on vacation, and vacation travel is a luxury.**

5. Insulin **Inelastic** Why? **Nothing could be more necessary for a diabetic.**

6. Insulin at one of four drugstores in a shopping mall **more elastic** Why? **Competition provides substitute goods. That is one reason competition is so important—it keeps prices down.**

ACTIVITY 22 **ANSWER KEY**
Elasticity of Demand and Changes in Total Revenue

Now let's do some problems to drive home the point. For each problem, complete the mathematics, fill in the answer blanks and circle the correct answer. Then write whether the product has an elastic or inelastic demand schedule between these two prices. The first problem is completed for you.

2. Price falls from $10 to $9. Quantity demanded increases from 100 to 110.

   a. Old price x quantity demanded = old total revenue
   10 100 1,000

   b. New price x quantity demanded = new total revenue
   9 110 900

   c. P [✓ ↓] ↑ TR [✓ ↓] ↑ **inelastic**

3. Price rises from $6 to $9. Quantity demanded decreases from 60 to 50.

   a. Old price x quantity demanded = old total revenue
   6 60 360

   b. New price x quantity demanded = new total revenue
   9 50 450

   c. P ↓ [✓ ↑] TR ↓ [✓ ↑] **inelastic**

4. Price falls from $6.50 to $6.00. Quantity demanded increases from 100 to 200.

   a. Old price x quantity demanded = old total revenue
   6.50 100 650

   b. New price x quantity demanded = new total revenue
   6.00 200 1,200

   c. P [✓ ↓] ↑ TR ↓ [✓ ↑] **elastic**

5. Price falls from $4.00 to $3.75. Quantity demanded increases from 300 to 340.

   a. Old price x quantity demanded = old total revenue
   4.00 300 1,200

   b. New price x quantity demanded = new total revenue
   3.75 340 1,275

   c. P [✓ ↓] ↑ TR ↓ [✓ ↑] **elastic**

ACTIVITY 22 ANSWER KEY continued

6. Why do price and total revenue go in opposite directions when the demand for the good is elastic?

   Because the percentage change in quantity demanded is greater than the percentage change in price. The revenue gained from the increase in quantity demanded is greater than the revenue lost from the decrease in price.

7. Why do price and total revenue go in the same direction when the demand for the product is inelastic?

   Because the percentage change in quantity demanded is less than the percentage change in price. The revenue gained from the increase in quantity demanded is less than the revenue lost from the decrease in price.

ACTIVITY 23 **ANSWER KEY**
Applying Elasticity to the Real World

Each of the following stories contains an assumption about elasticity of demand. For each story:

a. State whether the assumption made about the elasticity of demand is correct or is wrong.
b. Justify your answer.

1. I.M. Politico, a candidate for the state legislature, is proposing a large increase in the tax on cigarettes and liquor. He says, "I'm not proposing these taxes to raise revenue but to discourage reckless drinking and the filthy smoking habit. If the prices of cigarettes and booze go up, most people will quit using them. After all, no one needs to drink or smoke."
   a. **I.M. is wrong.**
   b. **He assumes that demand for these products is elastic, but it is not. He therefore falsely concludes that a tax increase on cigarettes and liquor will curb their consumption a great deal. In fact, taxes on these commodities will curb their consumption very little.**

2. U.R. Kool, a candidate for Congress, proposes freezing the price of gasoline. "There is no substitute for gasoline," he says. "People have to get from one place to another. Economists who say higher prices will discourage people from buying as much gas as before don't live in the real world."
   a. **U.R. is wrong.**
   b. **There are many methods of saving gasoline, including using small cars, car pooling, and using public transportation. In fact, following the huge rises in the price of gasoline since 1973, people have conserved on the use of gasoline, and sales of gasoline have been lower than they would have been had gasoline prices not risen.**

3. Councilman Vic Acqua opposed a price increase for water during a recent drought. He claimed that there is no substitute for water, and that therefore the demand for water is inelastic. He believes an increase in the price of water (water taxes) will result in the same quantity of water used as before the price went up.
   a. **Vic Acqua's assumption is wrong.**
   b. **Demand for water is inelastic, but raising its price will curb consumption somewhat.**

4. Sky King, world traveler, says if the airlines want to attract more passengers, they should lower fares for business travelers as well as for vacationers. Both groups should respond equally to a price decrease.
   a. **Sky's assumption is wrong.**
   b. **He assumes that both business travelers and vacationers have an elastic demand for air travel. Business travelers' demand for air travel is inelastic because they cannot as easily postpone or give up their air travel. Vacationers can postpone their air travel, use other means of transportation, or change their destination so as not to require air travel or to require less of it.**

ACTIVITY 24 **ANSWER KEY**
Elasticity Coefficients

So far, you have used the total revenue method to determine if demand was elastic, inelastic, or unit elastic. Now it is time to get more precise. To gain this precision, economists calculate price *elasticity of demand* (*Ed*) coefficients. The price elasticity of demand coefficient is calculated by dividing the percentage change in quantity demanded by the percentage change in price.

$$Ed = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}}$$

Because of different bases, the formula works like this:

$$Ed = \frac{\dfrac{\Delta Q}{(Q_1 + Q_2)/2}}{\dfrac{\Delta P}{(P_1 + P_2)/2}}$$

Because the relationship of quantity demanded and price is inverse, the coefficient will always yield a negative number. However, because it is understood to be negative, we drop the negative symbol. If E is greater than 1, demand is elastic. If E is less than 1, demand is inelastic. If $E = 1$, demand is unit elastic.

1. Suppose you are given the following data on the market demand for compact discs at a local store:

Local Market Demand for CDs

Price ($)	Quantity demanded per day
12	50
10	70
8	80
6	95

a. What is the price elasticity of demand over the price range of $12 to $10? **1.83–elastic**

b. What is the price elasticity of demand over the price range of $10 to $8? **.60–Inelastic**

The concept of price elasticity also applies to supply. Price *elasticity of supply* (*Es*) is defined as the percentage change in quantity supplied divided by the percentage change in the price of the good. The formula is

$$Es = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}}$$

Because of different bases, the formula works like this:

$$Es = \frac{\dfrac{\Delta Q}{(Q_1 + Q_2)/2}}{\dfrac{\Delta P}{(P_1 + P_2)/2}}$$

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ACTIVITY 24 ANSWER KEY continued

Because price and quantity supplied are a direct relationship, there is no need to change the sign. If *E* is greater than 1, the elasticity of supply is elastic. If *E* is less than 1, the elasticity of supply is inelastic. If *E* = 1, elasticity of supply is unit elastic.

2. Suppose you are given some information on market supply for compact discs at a local store:

Local Market Supply for CDs

Price ($)	Quantity supplied per day
12	100
10	90
8	80
6	50

a. What is the price elasticity of supply over the price range of $12 to $10? **.58–inelastic**

b. What is the price elasticity of supply over the price range of $10 to $8? **.53–inelastic**

In addition to price elasticity of demand, economists determine income elasticity of demand. This measure relates the percentage change in the quantity of a good purchased to the percentage change in income. In most cases, the relationship is positive. An increase in income causes an increase in the quantity of the good purchased. These goods are called *normal goods*. In a few cases, the relationship is negative. These goods are called *inferior goods*. Steak is an example of a normal good; cabbage and turnips might be examples of inferior goods.

3. Suppose you are given the following information on the spending habits of a family:

A Family's Spending Habits

	Income per month	Quantity of potatoes demanded per month	Quantity of steak demanded per month
Year 1	$1,000	4 lb.	2 lb.
Year 2	$1,500	3 lb.	6 lb.

a. What is the income elasticity of demand for potatoes? **–.71**

b. Are potatoes a normal or inferior good? **Inferior good**

c. What is the income elasticity of demand for steak? **2.50**

d. Is steak a normal or inferior good? **normal good**

e. What qualities make a good inferior or normal?
A normal good is one that people buy more of when they have higher incomes. An inferior good is one people buy less of when they have higher incomes.

UNIT 2, LESSON 6

Price Ceilings and Floors

Introduction and Description

Legislators often have been dissatisfied with the outcomes of free markets. The invisible hand is not good enough for them so they mandate prices that are lower or higher than the equilibrium price. A price ceiling is a legal maximum price that may be charged for a good or service. If a price ceiling is below the equilibrium price, it will cause shortages and illegal, or black, markets to develop. A price floor is a legal minimum price that may be charged for a good or service. If a price floor is above the equilibrium price, it will cause surpluses.

In your presentation of price ceilings and floors, discuss how changing prices are incentives determining what to produce, how to produce, and for whom to produce. Sometimes students are mechanistic and merely identify shortages and surpluses on a graph. They should, instead, understand why price ceilings cause shortages and price floors cause surpluses. People react to incentives in predictable ways.

Objectives

1. Define and describe *price ceilings* and *price floors*.
2. Illustrate price ceilings and floors on graphs.
3. Analyze the effects of price ceilings and floors in terms of surpluses and shortages.
4. Analyze how prices act as incentives that influence human behavior.

Time Required

- Three class periods

Materials

1. Activities 25, 26, 27, and 28
2. Visuals 2.9 and 2.10

Procedure

1. Use Visual 2.9 to illustrate a price ceiling. Ask questions such as the following.
   a. What is the quantity demanded and supplied of Greebes at the equilibrium price? Why?
   b. What is the quantity demanded if there is a $2 price ceiling mandated by the government? Why? (Emphasize that the lower price is an incentive for buyers to buy more Greebes.)
   c. What is the quantity supplied at a price ceiling of $2? Why? (Emphasize that a lower price is an incentive for producers to produce fewer Greebes and use their resources to produce something else.)
   d. With the price ceiling, what is the shortage of Greebes?
   e. If people want to buy more Greebes than sellers want to produce, who will get the Greebes? (This question should lead to a discussion on price ceilings' effects, such as the development of black markets.)
   f. Why do we call a price that is lower than equilibrium a "price ceiling"? (This confuses students. Point out that the price cannot go higher than the price ceiling. If they could jump just ten feet, the ceiling would keep them from going higher.)
   g. What would happen if all goods and services were free? Who would produce the goods and services? What would happen to inventories? What would be the long-run effects of such a policy? (Students sometimes have problems conceptualizing the idea that price ceilings can have harmful effects. After all, aren't lower prices a good thing for consumers? Students fail to see the effects of lower prices on producers. The discussion of these questions will help students visualize these effects.)
2. Use Visual 2.10 to illustrate price floors. Ask questions such as these.
   a. What is the quantity demanded and quantity supplied at the equilibrium price? Why?

LESSON 6 continued

b. What is the quantity demanded if there is a price floor of $5? Why? (Emphasize the concept that a higher price makes the opportunity cost of buying a Greebe higher.)

c. What is the quantity supplied at a price ceiling of $5? Why? (Emphasize that a higher price is an incentive to producers to supply more Greebes.)

d. At a price ceiling of $5, what is the surplus of Greebes?

e. If people want to sell more Greebes than consumers want to buy, who will get the surplus? (The government will probably buy them or the price floor will not be effective.)

f. Why is this called a "price floor"? In economics, why is a price floor above a price ceiling? (The floor keeps the price from going lower just like the floor in the classroom keeps students from going lower.)

3. Have the students answer the questions in Activity 25 and discuss the answers.
4. Discuss the effects of rent controls.
5. Have the students answer the questions in Activity 26 and discuss the answers.
6. Discuss the effects of minimum-wage laws on employment. This may be more difficult for students because it concerns factor markets rather than the product markets with which they are more familiar. Also, students will view high wages as good just as they may view low prices as good. It is important to discuss the incentives for employers.
7. Have the students answer the questions in Activity 27 and discuss the answers.
8. Activity 28 is the most difficult Activity in this lesson and should take an entire class period. The purpose of this Activity is to get students to apply the supply and demand model to a policy problem and to develop their ability to interpret graphs with specific numerical scales in order to evaluate the results of different policy proposals under different conditions of demand elasticity. The policy implications of this problem indicate that, given a policy decision to increase farm income (a goal that may be debated), there are alternative ways to do this, which have different implications for other goals: food prices to consumers, the amount of food consumed, cost to taxpayers, etc. You should note that crop restriction programs raise prices, but they may or may not raise total farm income, depending on the relative elasticity of demand. There are also some interesting comparisons of loan-storage policies and direct payment policies.

Some of the big policy points, with farm income the same, are:

a. With loan-storage plans and an upward sloping supply curve, the market price to consumers is higher than the free market equilibrium price, and the amount of food available to consumers is less than the free market equilibrium quantity.

b. With direct payment plans and an upward sloping supply curve, the market price to consumers is actually less than the free market equilibrium price, and the amount of food available to consumers is actually more than the free market equilibrium quantity.

c. With inelastic demand, loan-storage programs may cost taxpayers less than direct payment plans (ignoring storage costs).

d. With elastic demand, direct payment plans cost taxpayers less than loan-storage plans (ignoring storage costs).

e. Other implications can be analyzed and discussed with systematic applications of the formal decision making grid included in the answer key.

There are several things to look out for in this Activity. Students often have trouble reading (from the demand schedule) the price consumers would pay for 70 million

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LESSON 6 continued

bushels under the direct payment plan. Tell them to look at the diagram and see what it says. If you wish, the class discussion can be structured around a systematic application of the formal decision-making grid in the answer key. In discussing this grid in class, you can use simple symbols: + (helps achieve the goal), – (hurts the achievement of the goal), 0 (does not affect the goal), or ? (effect uncertain, depending on further assumptions or information). You can use double ++ or double – – for really helps or really hurts, or you can use the specific numbers shown. The big point is: which policy is "best" depends on which goal or criterion you think is the most important and which tradeoffs you are willing to make when desirable goals conflict with each other.

9. Have the students complete the questions in the Activity and discuss them.

ACTIVITY 25 **ANSWER KEY**
Price Floors and Ceilings

Price floors and ceilings can be plotted with supply and demand curves. Use the chart to answer the questions. Fill in the answer blanks or cross out the incorrect words in parentheses.

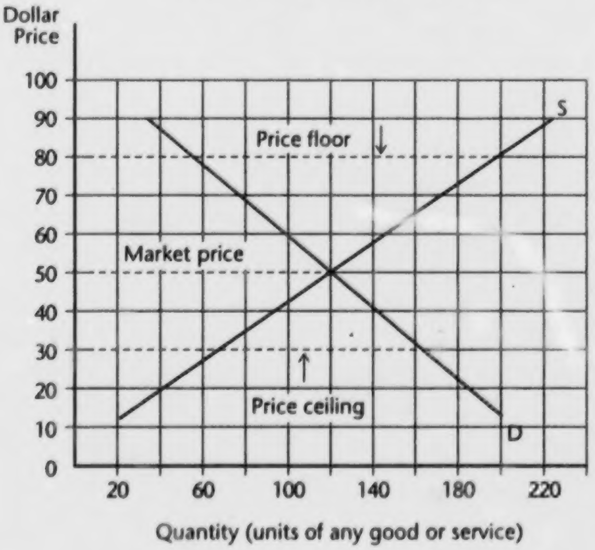
1. What is the market price? **$50**

2. What quantity is demanded and what quantity is supplied at the market price?
   a. Quantity demanded **120**
   b. Quantity supplied **120**

3. What quantity is demanded and what quantity is supplied if the government passes a law requiring the price to be no higher than $30? This is called a *price ceiling.*
   a. Quantity demanded **about 160**
   b. Quantity supplied **about 60**
   c. There is a *(shortage/~~surplus~~)* of **100**.

4. What quantity is demanded and what quantity is supplied if the government passes a law requiring the price to be no lower than $80? This is called a *price floor.*
   a. Quantity demanded **about 60**
   b. Quantity supplied **about 200**
   c. There is a *(~~shortage~~/surplus)* of **about 140**.

A Price Floor and Ceiling



ACTIVITY 26 **ANSWER KEY**
Rent Controls and Affordable Housing

Imagine that the voters in your city are going to vote on a law that would (1) roll back all rents on houses and apartments to the levels of two years ago and (2) freeze rents at those levels. At the many meetings held on this proposal, citizens have argued furiously. Among the comments you heard was the following:

> "Rents are too high for people on fixed incomes like my husband and me. With prices going up and up, our pension and social security checks just aren't enough. Everyone should have the right to decent housing. We have worked all our lives. Now all we ask is that rents be kept at an affordable level. That's the fair thing to do."

You also heard from the opposite side:

> "Rent controls cause housing shortages. And housing shortages allow rental property owners to discriminate against any group they think is undesirable—families with children or pets, minorities, senior citizens. Also, with rent controls, the rent the owners get over a period of years won't be enough to maintain many older apartments and houses properly. This will lead to blighted neighborhoods. If access to housing is the problem, raising the incomes of poor people—not rent controls—is the answer."

Now you must decide how to vote.

1. What is the issue?
The issue is whether voters should pass a rent control measure that would freeze rents at the level of two years ago.

2. Draw a supply and demand graph that illustrates the issue. Does the issue involve a price floor, a price ceiling, or neither?
The graph should be similar to Visual 2.9. However, rent should be on the vertical axis and quantity of housing on the horizontal axis.

3. What broad social goals should you consider as you decide how to vote on the issue?
The broad social goals are economic freedom, economic fairness or equity, and economic efficiency.

4. What are some alternative means of achieving these goals?
You could have the free market determine rents. If equity were a problem, you could provide aid to poor people or subsidize their rents.

5. What are some advantages of each alternative? Be sure to consider who wins and who loses by each alternative.
Answers will vary. However, rent controls will cause economic inefficiency and shortages.

6. How would you vote on the issue? Why?
Encourage students to support their opinions with economic analysis.

ACTIVITY 27 **ANSWER KEY**
The Minimum Wage and Unemployment

Imagine that you are a member of the U.S. House of Representatives. You must decide whether to vote *yes* or *no* on a bill that would raise the minimum wage. In committee hearings on the bill, you heard testimony from people who favor the increase and from people who oppose it. For example, you heard one spokeswoman say:

> "We're experiencing high inflation. The minimum wage must be raised accordingly. Otherwise, the working poor will receive wages that are miserably below what is needed to provide food, housing, and other necessities. Every worker has a right to earn a decent, living wage. The present minimum is too low and is therefore unjust and unfair."

And you heard an opponent of the minimum wage state:

> "The minimum wage should be allowed to expire. It creates unemployment, especially among disadvantaged minorities and teenagers. It creates incentives for businesses to substitute machines for people. People without jobs are worse off than people with low-paying jobs. This is particularly true for teenagers. Teenage unemployment is much higher than adult unemployment. One of the reasons is that the minimum wage reduces the number of jobs for teenagers with few skills, for at the minimum wage, businesses would rather hire older people who are more skilled or who have more work experience. Such hiring decisions tend to discriminate against young African–Americans who, on the average, have less education and fewer skills than their white counterparts. Don't raise the minimum wage; eliminate it."

Now you must decide how to vote.

1. What is the issue?
   The issue is whether to increase the minimum wage.

2. Draw a supply and demand graph that illustrates the issue. Does the issue involve a price floor, a price ceiling, or neither?
   The graph should look like Visual 2.10. However, wages should be on the vertical axis and number of workers on the horizontal axis.

3. What broad social goals should you consider as you decide how to vote on the issue?
   Some relevant broad social goals are full employment for teenagers, full employment for others, economic freedom, and economic fairness or equity.

4. What are some alternative means of achieving these goals?
   Some alternatives are: raise the minimum wage, eliminate the minimum wage for teenagers, and keep the minimum wage the same.

5. What are some advantages of each alternative? Be sure to consider who wins and who loses by each alternative.
   Answers will vary. Be sure to consider who gains and who loses from each alternative.

ACTIVITY 27 ANSWER KEY continued

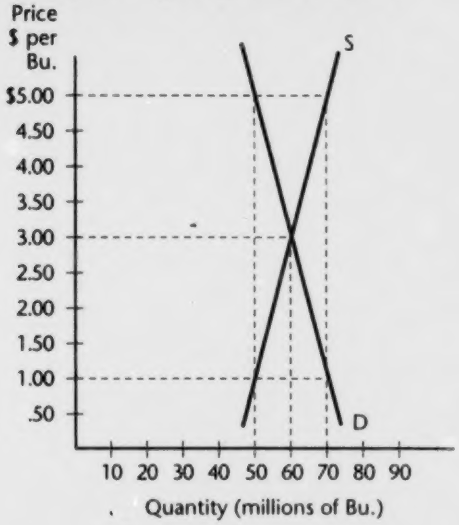
6. How would you vote on the issue? Why?
Answers will vary. People who anticipate they can get a job at the minimum wage will probably support raising the minimum wage. People who anticipate losing their jobs because of a higher minimum wage may oppose it. People who feel they will make a lot more than the minimum wage may use economic analysis to support their position.

ACTIVITY 28 **ANSWER KEY**

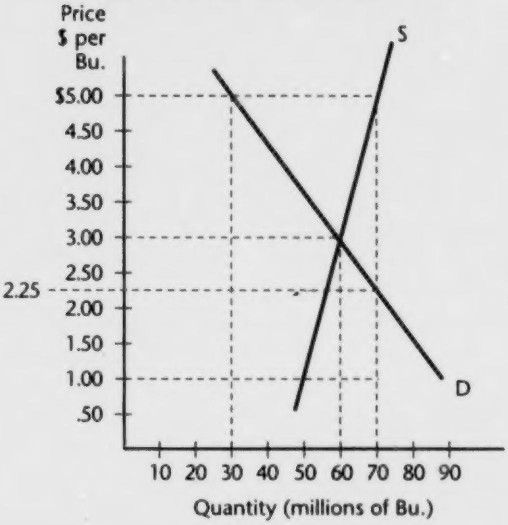
Farm Price Supports

Below are two different diagrams of the market for a "typical" agricultural product. Study both diagrams, and use them to answer the questions that follow. Fill in the answer blanks or cross out the incorrect words in parentheses.

Case A:
A Typical Agricultural Product



Case B:
A Typical Agricultural Product



1. Under free market conditions, the equilibrium price in both Case A and Case B would be $ **3.00** per bushel, people would buy and consume **60** million bushels, and total farm revenue would be $ **180** million. **($3 x 60)**

Now assume the government decides farmers should receive $5.00 (not $3.00) per bushel for this product. There are at least three different policies that the government could adopt to achieve this objective. Each of these polices is explained. Study these explanations, and use the diagrams above to analyze the effects of each policy in both Case A and Case B.

Policy 1: Crop Restriction Program

2. Suppose the government can persuade farmers to reduce the supply (shift the whole supply curve to the left) to the extent that a new market equilibrium price of $5.00 per bushel is established. Under this program:
   a. In Case A people would buy and consume **50** million bushels, and total farm revenue would be $ **250** million. **($5 x 50)**
   b. In Case B people would buy and consume **30** million bushels, and total farm revenue would be $ **150** million. **($5 x 30)**

   If no taxpayers' money is used to persuade (or "bribe") farmers to restrict their supply, we can assume that the total cost of this program to taxpayers, *per se*, would be zero. (not likely)

ACTIVITY 28 ANSWER KEY continued

Policy 2: Loan-Storage Program

3. Suppose the government tells farmers it will "lend" them $5.00 a bushel for this product. They can sell as much of their output as they want on the open market at $5.00 a bushel, and repay the government in cash; but if they have some output that they can't sell at this price, they can give the product itself to the government in repayment for their loans and the government will store the surplus. (NOTE: In effect, this says, "Grow all you can profitably produce at $5.00 a bushel and sell as much of it as you can to the public at that price. The government will then use tax dollars to purchase all leftovers at $5.00 a bushel.") Under this program:

   a. In Case A people would buy and consume **50** million bushels and they would pay farmers a total of $**250** million. Further, the government would buy and store **20 [70 – 50]** million bushels at a cost to the taxpayer of $**100** million (not counting storage cost), and total farm revenue would be $**350** million. **($250 + $100)**

   b. In Case B people would buy and consume **30** million bushels and they would pay farmers a total of $**150** million. Further, the government would buy and store **40 [70 – 30]** million bushels at a cost to the taxpayer of $**200** million (not counting storage cost), and total farm revenue would be $**350** million. **($150 + $200)**

Policy 3: Direct Payment Plan

4. Suppose the government tells farmers, "We will guarantee you $5.00 a bushel, but everything you produce at this price must be sold on the open market for whatever buyers will pay for this quantity; then we will give you, at taxpayers' expense, the difference between the price that buyers pay and $5.00 a bushel."

   a. In Case A people would buy and consume **70** million bushels, and they would pay farmers a total of $**70** million. Further, the government would use taxpayers' money to pay the farmers another $**280** million, and total farm revenue would be $**350** million.

   b. In Case B people would buy and consume **70** million bushels, and they would pay farmers a total of $**157.50** million. Further, the government would use taxpayers' money to pay the farmers another $**192.50 [$5 – $2.25 = $2.75 x 70]** million, and total farm revenue would be $**350 [$157.50 + $192.50]** million

5. If your goal was minimum cost to taxpayers (ignoring storage cost or "bribes" to get crop restriction), which of these programs would you favor?

   a. In Case A? *(crop restriction/~~loan storage/direct payment~~)* Why?

      No storage cost or "bribes" in the information given.

   b. In Case B? *(crop restriction/~~loan storage/direct payment~~)* Why?

      No storage cost or "bribes" in the information given.

ACTIVITY 28 ANSWER KEY continued

6. If your goal was maximum food consumption by the people, which of these programs would you favor?

   a. In Case A? *(~~crop restriction~~/~~loan storage~~/direct payment)* Why?

   70 > 50

   b. In Case B? *(~~crop restriction~~/~~loan storage~~/direct payment)* Why?

   70 > 30

7. What is the main difference between the economic situation in Case A and Case B?

   The demand in case A is more inelastic (less elastic) than in case B.

8. Do you think that the price elasticity of demand for most agricultural products in the real world is relatively elastic or relatively inelastic? Do you think there might be a difference in the price elasticity of demand for a single agricultural product and for all agricultural products as a group? Why?

   The demand for agricultural products *as a whole* is relatively inelastic. Everyone has to eat, and there are not very good substitutes for agricultural products *as a whole*. Once a person has eaten, however, the limited capacity of the human stomach (and rapidly diminishing marginal utility) cuts one's desire for much greater quantities as price is lowered.

   BUT, if a price support was put on only one of several similar agricultural products, the demand for *only one* product would tend to be much more elastic because of the availability of substitutes and the strength of the substitution effect.

   [N.B. This is why attempts to get price supports in Congress have been for groups of grains such as corn *and* wheat *and* rice *and* peanuts, and not only one grain, e.g., corn.]

COMBINED DECISION-MAKING GRID FOR ACTIVITY 28

GOALS OR CRITERIA

ALTERNATIVES	Increase Total Farm Income		Hold Down Prices To Consumers		Increase Total Food Consumption		Hold Down Direct Costs to Taxpayers		Minimize Enforcement and Administrative Cost		Other	
	Relatively Inelastic Demand	Relatively Elastic Demand	Relatively Inelastic Demand	Relatively Elastic Demand	Relatively Inelastic Demand	Relatively Elastic Demand	Relatively Inelastic Demand	Relatively Elastic Demand	Relatively Inelastic Demand	Relatively Elastic Demand	Relatively Inelastic Demand	Relatively Elastic Demand
1. Do Nothing	– $180 M	– $180 M	0 $3 per BU.	0 $3 per BU.	0 60 M BU.	0 60 M BU.	+ None	+ None	+ None	+ None	?	?
2. Crop Restriction	+ $250 M	– $150 M	– $5 per BU.	– $5 per BU.	– 50 M BU.	– – 30 M BU.	0 ? Depends on if there are payments ("bribes") to restrict	0 ?	? – There will likely to be some enforcement costs.	? –	?	?
3. Loan-Storage	+ + $350 M	+ + $350 M	– $5 per BU.	– $5 per BU.	– 50 M BU.	– – 30 M BU.	– $100 M	– – $200 M	– There will be storage costs for 20 M Bu.	– –	?	?
4. Direct Payment	+ + $350 M	+ + $350 M	+ + $1 per BU.	+ $2.25 per BU.	+ 70 M BU.	+ 70 M BU.	– – $280 M	– $192.5 M	0 ? Some costs are likely, they should be lower than in 2 or 3.	0 ?	?	?
5. Other?	?	?	?	?	?	?	?	?	?	?	? ?	? ?

Relatively Inelastic Demand and Relatively Elastic Demand can be discussed separately, but they are both shown on this grid to avoid retyping.

UNIT 2, LESSON 7

Complex Application Questions in Supply and Demand

Introduction and Description

This lesson requires students to apply price theory to a variety of situations. Learning the laws of economics is not enough. Problem solving concentrates the mind and forces students to really understand an economic concept. Because many AP test questions will be complex application questions, these problems are good practice for the AP test.

Objectives

1. Apply price theory concepts to analyze market behavior.
2. Analyze how prices act as rationing devices, allocate resources, and determine income distribution.

Time Required

- One class period

Materials

1. Activity 29

Procedure

1. You may assign Activity 29 as homework a few days before it is due. An alternative is to have the students work on the problems in groups.
2. Discuss the answers.

ACTIVITY 29 **ANSWER KEY**
Pricing Problems

For each of these situations, give an answer of one or two sentences. Then support that answer with sound economic reasoning. In most cases, it would help to use a graph to illustrate your answer.

1. "Gold is valuable because so many people hunt for it." True, false, or uncertain? Why?
   ***False.* Gold is valuable because of supply and demand. People search for gold because it is valuable. There is a fairly small quantity supplied and a high quantity demanded for gold. The price of something does not depend solely on the cost of production.**

2. A consumer group believes the prices of necessities such as food, housing, energy, and medical care should be controlled by the government. "People can afford higher prices for luxuries," they reason, "but all of us, and especially the poor, suffer when the prices of necessities rise." Evaluate the effects of this plan.
   This is a price ceiling and will probably cause a shortage of necessities. This, of course, will happen only if the administered controlled price is lower than the equilibrium price. This administered price will provide incentives for consumers to buy more necessities (an increase in quantity demanded) and incentives for producers to produce less (a decrease in quantity supplied).

3. State Representative Smith feels that New York can raise revenue by increasing license plate and registration fees 500%. With five times the revenue, the state can solve a lot of problems. Is he right? Why or why not?
   Representative Smith is wrong. The demand for license plates is inelastic or vertical but not perfectly inelastic. Therefore, a 500% rise in price would not yield 500% more revenue. There are substitutes for cars, such as car pooling and use of mass transit.

4. Make the optimistic assumption that one day you will be a college graduate. Would you support a law to raise the legal minimum wage of college graduates to $50,000?
   This is a price floor and would probably increase unemployment among college graduates if the controlled price is above the equilibrium price. There would be incentives for college graduates to work and incentives for employers to hire noncollege graduates at lower wages. This would cause a surplus of workers or higher unemployment.

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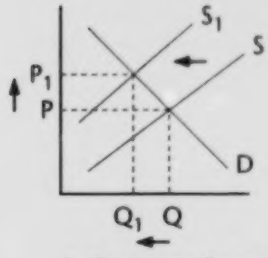
ACTIVITY 29 ANSWER KEY continued

5. Recently the price of beef rose. By drawing graphs, show that the rise in price could be consistent with the following:
   a. The quantity of beef consumed falling.
   b. The quantity of beef consumed rising.
   c. The quantity of beef consumed staying the same.

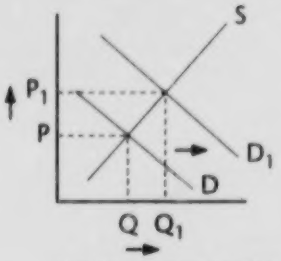
   Be sure to draw a graph for each situation and provide a brief explanation of each situation.

Graph for a.



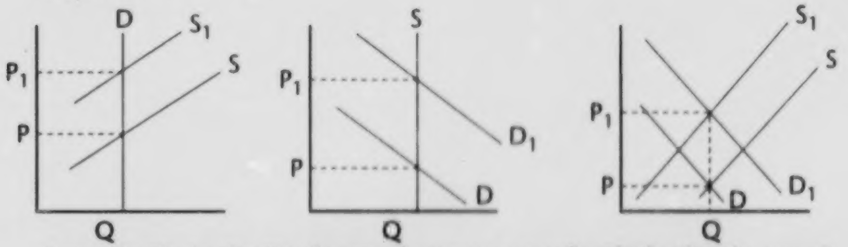
A decrease in supply.

Graph for b.



An increase in demand.

Graph for c.



A perfectly inelastic demand curve, a perfectly inelastic supply curve, or a simultaneous increase in demand and decrease in supply. Students have the most trouble with this concept. This question also illustrates that the reason for a price change is more complicated than many armchair economists think.

6. A lobbyist for the Dairy Association of America is asked to comment on how the elimination of the government's milk price-support program would affect the price of milk. Her statement follows:

   > The elimination of price supports would, in our opinion, result in an increase in milk prices within 2 months. Certainly, the immediate effect would be to reduce prices. But as prices fall, demand would increase. We believe this increase in demand would be so strong that within 2 months prices would be higher.

   Comment on the lobbyist's argument.

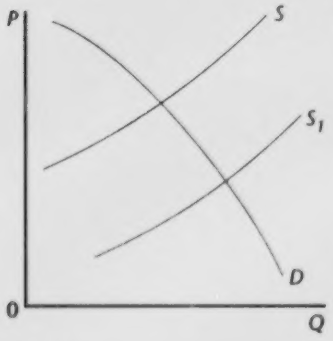
   This lobbyist is confusing a change in demand (shift of the curve) with a change in quantity demanded (move along the curve). The phrase "but as prices fall, demand would increase" is wrong. The quantity demanded increased because prices fell. In the absence of other changes, that will be the end of it.

ACTIVITY 29 ANSWER KEY continued

7. Recently the Franklins asked a realtor to show them houses for sale in their town. The Franklins bought a house that the realtor showed them. They complained to the realtor after purchasing the house, "We can't understand why realtors get 6% of the purchase price as a fee. All you did was drive us to a few houses and show us around. It's outrageous!" Comment on the Franklins' complaint.
   Middlemen, such as real estate brokers, bring buyers and sellers together. This is an economic function. The public's suspicion of middlemen is economically incorrect. If middlemen didn't provide a service, people wouldn't pay them. The realtor reduces search costs. Information is a scarce good. A rational seller will continue acquiring information until the anticipated marginal gain is greater than the additional marginal cost of getting the information. A rational buyer will behave in the same way.

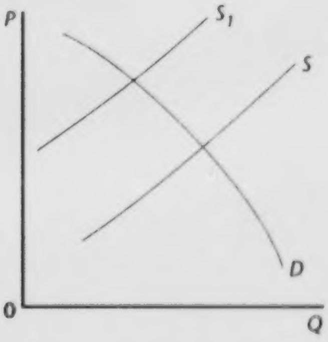
8. Illustrate the following situations on a graph:
   a. The legalization of narcotics.
   b. The U.S. government purchased the entire cocaine supply in Colombia.
   c. Enforcement of drug laws is aimed at pushers.
   d. Enforcement of drug laws is aimed at users.
   Be sure to explain your graphs.

Graph a.



a.
Legalization would increase supply and lower price because the opportunity cost of being in the drug business would be less. Quantity demanded would increase. Some students say demand would also decrease because illegality is a reason that people buy drugs. Others say demand would increase because the opportunity cost of using drugs would be less.

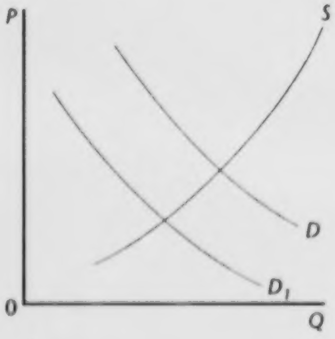
Graphs b,c.



b.
This would decrease supply, raise price, and lower quantity demanded.

c.
This would decrease supply and raise price. The graph in 8b would also apply here.

Graph d.



d.
This would decrease demand, decrease price, and lower quantity supplied.

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ACTIVITY 29 ANSWER KEY continued

9. You learn that a prominent economist is going to give a lecture and you rush to get tickets. The economist says, "We economists don't know much, but we know how to create shortages and surpluses."
   a. How can government create a shortage in a competitive market? Illustrate this with a graph. Can you provide examples of this?
   Have an administered maximum price below market equilibrium. Students should explain how and why this shortage comes about. Rent controls and price freezes are examples.

   b. How can government produce a surplus in a competitive market? Illustrate this with a graph. Can you provide examples of this?
   Have an administered minimum price above market equilibrium. Students should explain how and why this surplus would occur. Examples are minimum-wage laws and farm price supports.

Answers to Sample Multiple-Choice Questions

1. d
2. e
3. b
4. d
5. d
6. b
7. a
8. d
9. c
10. a
11. d
12. c
13. c
14. d
15. a
16. a
17. b
18. b
19. a
20. d

Answers to Sample Short Essay Questions

1. Point Allocation—Basically, the point distribution is two points for part (a) and three for part (b).

Method I

Part (a): two points

Supply curve shifts to the left (the vertical distance is the amount of the tax) or supply decreases. The price paid by the consumer increases and the equilibrium quantity decreases.

one point—Supply curve shifts. If supply and demand are both shifted, the student does not receive the point.
1/2 point—Price increases.
1/2 point—Quantity decreases.

Part (b): three points

With a more elastic demand curve, the price increase is less and the quantity decrease is more. Government tax revenues will decline with the more elastic demand curve.

1/2 point—Price increase is less than in part (a).
1/2 point—Quantity decrease is more than in part (a).
one point—Explanation...includes expression of what "more elastic" means.
one point—Decrease in tax revenues relative to part (a) because quantity decrease is greater.

Method II

Part (a): two points

Demand curve shifts to the left (the vertical distance is the amount of the tax) or demand decreases. The price paid by the consumer increases (read off original demand curve at new equilibrium quantity) and the equilibrium quantity decreases (intersection of new demand curve and original supply curve).

one point—Demand curve shifts.
1/2 point—Price increases.
1/2 point—Quantity decreases.

Part (b): three points

With a more elastic demand curve, the price increase is less and the quantity decrease is more. Government tax revenues will decline with the more elastic demand curve.

1/2 point—Price increase is less than in part (a).
1/2 point—Quantity decrease is more than in part (a).
one point—Explanation...includes expression of what "more elastic" means.
one point—Decrease in tax revenues relative to part (a) because quantity decrease is greater.

ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

2. The statement is confusing an increase in supply with an increase in quantity supplied. When demand increases, price increases and quantity supplied increases. In the long run, supply will increase and become more elastic. Using Marshall's analysis, in an increasing cost industry, long-run equilibrium price will drop to a price slightly higher than the original price. In a constant cost industry, price would return to its original level but quantity would increase.

3. a. Demand increased.

   b. Supply decreased.

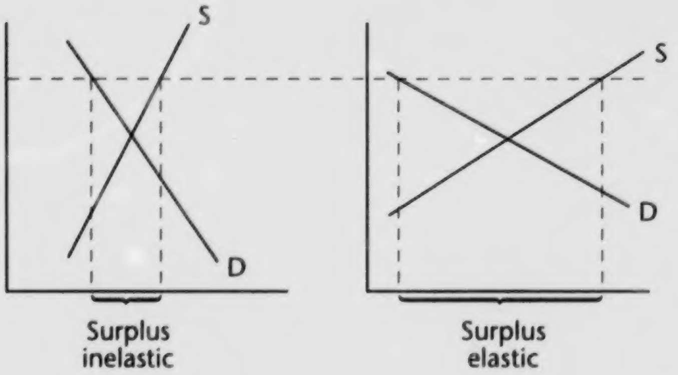
   c. (1) An increase in demand accompanied by a decrease in supply.

   (2) A perfectly inelastic supply or demand curve.

4. In the momentary situation, price would rise and quantity supplied would not change. In the short run, more wheat would come out of storage, and price would fall below momentary equilibrium. In the long run, farmers would plant more wheat, and price would fall more. In a constant-cost industry, price would return to its original level but quantity would increase. In an increasing-cost industry, price would not return to its original level.

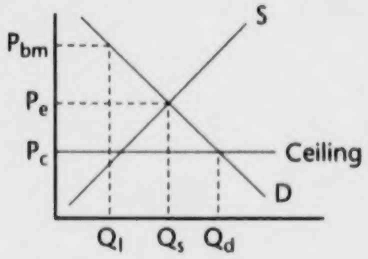
5. If the demand for haircuts is elastic, total revenue would fall if the price were raised.

6. The more elastic the supply and demand curves, the greater the surplus.



Answers to Sample Long Essay Questions

1. a. This would cause a shortage. Students should clearly explain why it would cause a shortage. The shortage would be more acute ultimately because there would be fewer incentives to build more apartments.



   b. In the short run, there is no time to sell or convert apartments. Quantity supplied (Q_s) stays the same, but quantity demanded increases to Q_d. A shortage from Q_s to Q_d exists.

   c. In the long run, apartments would be converted to condominiums or sold for other businesses. Quantity supplied will move to Q_l. Also, black markets could develop, and creative apartment owners could actually charge a price of P_{bm}.

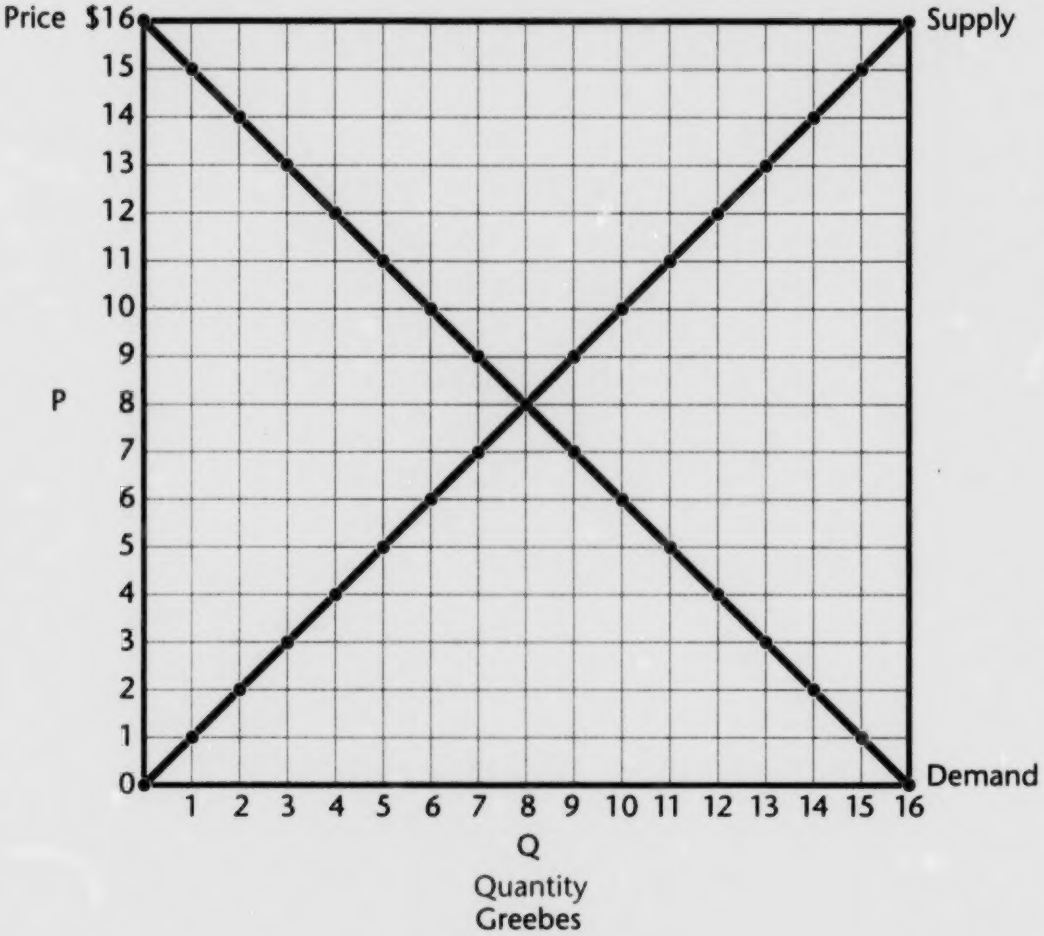
2. A price ceiling would cause a shortage. Quantity demanded would increase and quantity supplied would decrease. The shortage would be greater in the long run. This is because supply and demand are both more elastic in the long run. This could also be shown by shifting the supply curve leftward in the long run.

3. a. This is a price floor.
   - i. The minimum wage would decrease the number of workers employed in the industry (quantity of workers demanded).
   - ii. It would also increase the number of workers seeking employment (quantity of workers supplied).

   b. Higher wages increase the costs of production so supply would decrease or shift to the left. This would increase price and decrease the quantity of fast food available.

Visual 2.1

The Supply of and Demand for Greebes



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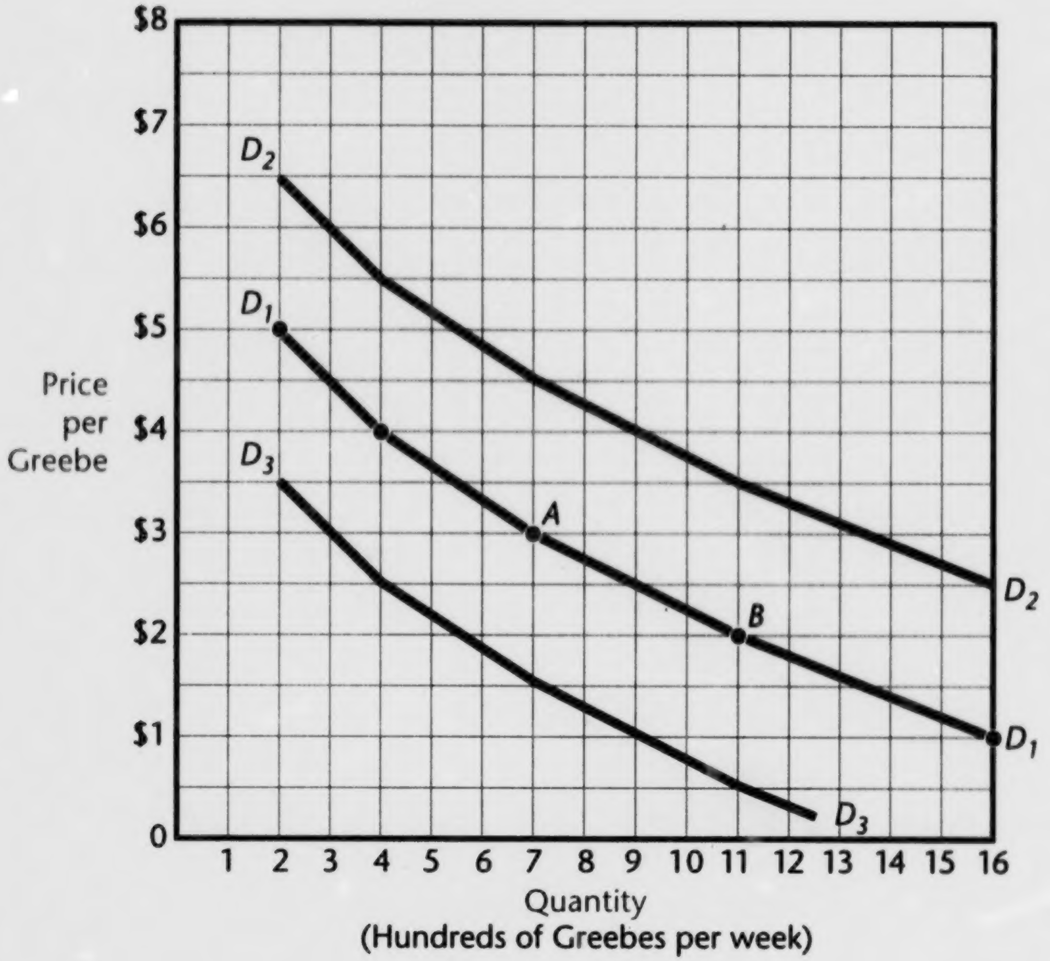
Visual 2.2

Changes in Demand and Quantity Demanded



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Visual 2.3

Determinants of Demand

FACTORS THAT SHIFT THE DEMAND CURVE

1. Change in consumer tastes

2. Change in the number of buyers

3. Change in consumer incomes

4. Change in the prices of complementary and substitute goods

5. Change in consumer expectations

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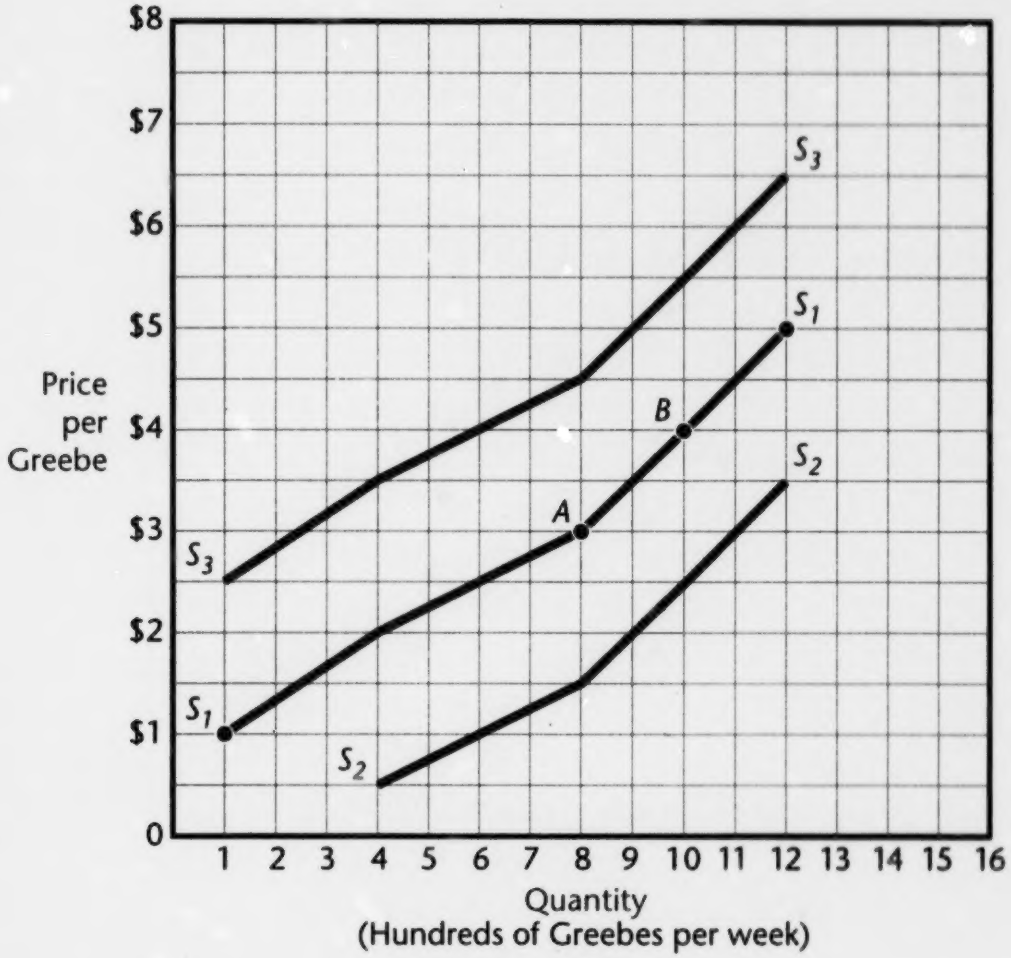
Visual 2.4

Changes in Supply and Quantity Supplied



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Visual 2.5

Determinants of Supply

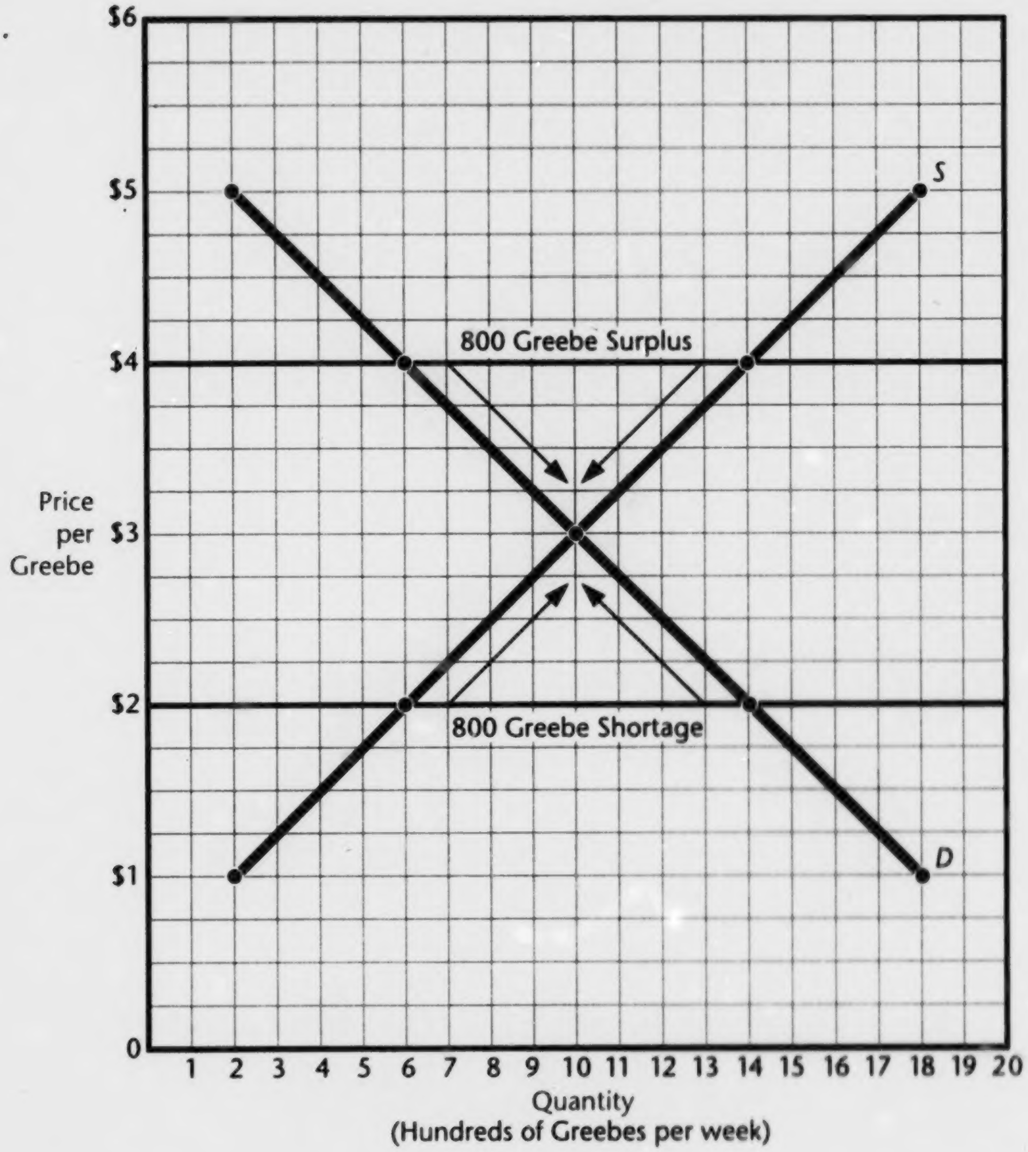
FACTORS THAT SHIFT THE SUPPLY CURVE

1. Change in input prices
2. Change in technology
3. Change in taxes and subsidies
4. Change in the prices of other goods
5. Change in producer expectations
6. Change in the number of suppliers

- Any factor that increases the cost of production decreases supply.
- Any factor that decreases the cost of production increases supply.

Visual 2.6

Equilibrium



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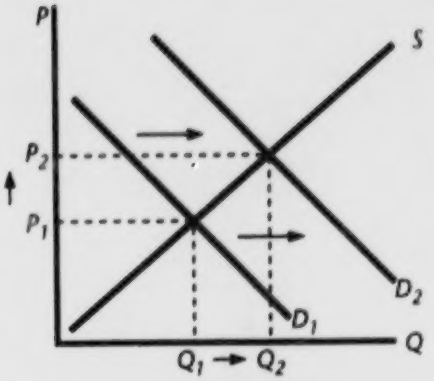
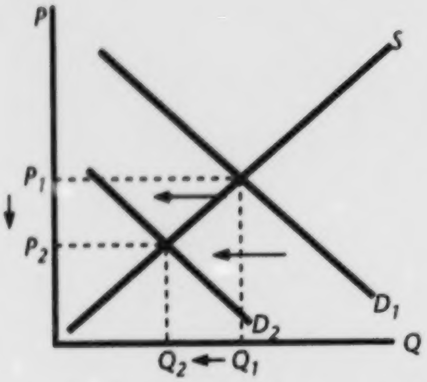
Visual 2.7

Shifts in Demand and Supply


P
S
P2
P1
D2
D1
Q
Q1 → Q2

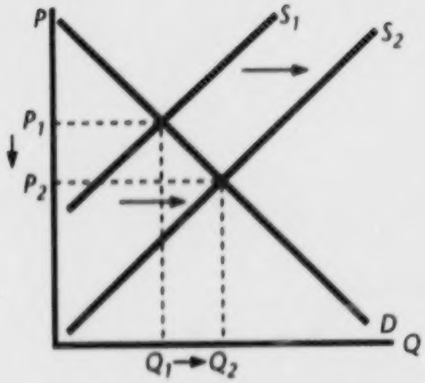
A. increase in demand

D ↑
P ↑
Q ↑


P
S
P1
P2
D1
D2
Q
Q2 ← Q1

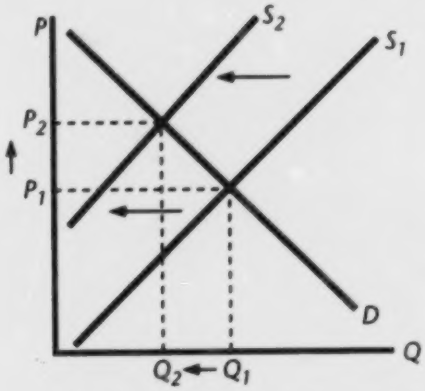
B. decrease in demand

D ↓
P ↓
Q ↓


P
S1
S2
P1
P2
D
Q
Q1 → Q2

C. increase in supply

S ↑
P ↓
Q ↑


P
S2
S1
P2
P1
D
Q
Q2 ← Q1

D. decrease in supply

S ↓
P ↑
Q ↓

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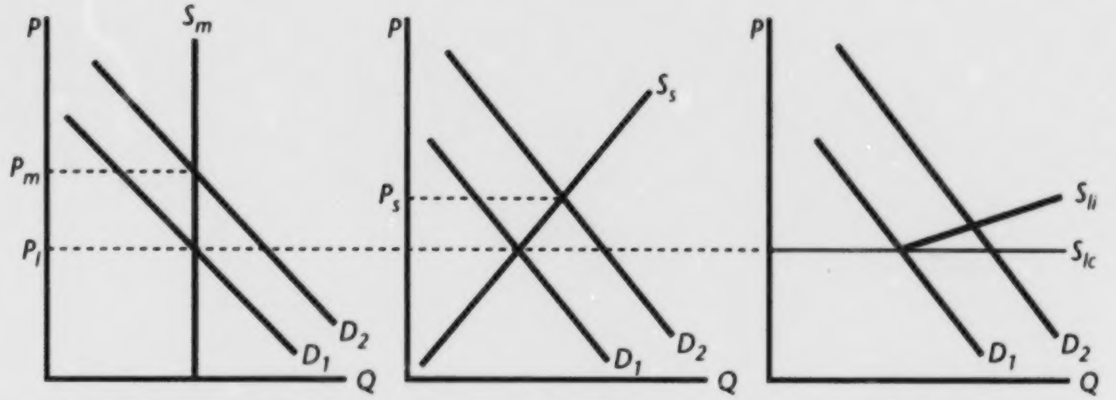
Visual 2.8

Time and Elasticity of Supply



Momentary time period

Short run

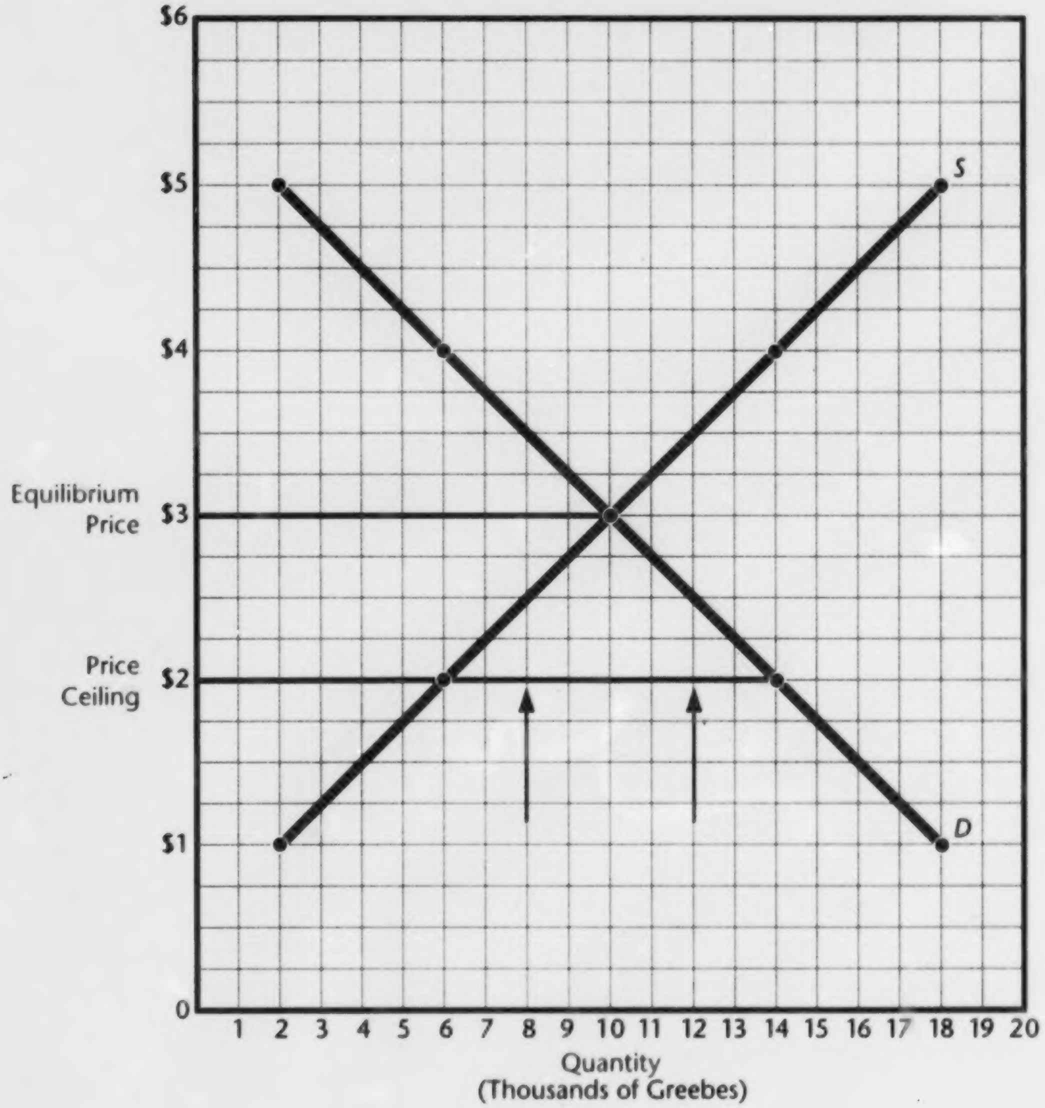
Long run

S_{li} assumes increasing costs
S_{lc} assumes constant costs

The longer the time period, the more elastic the supply of the product

Visual 2.9

A Price Ceiling



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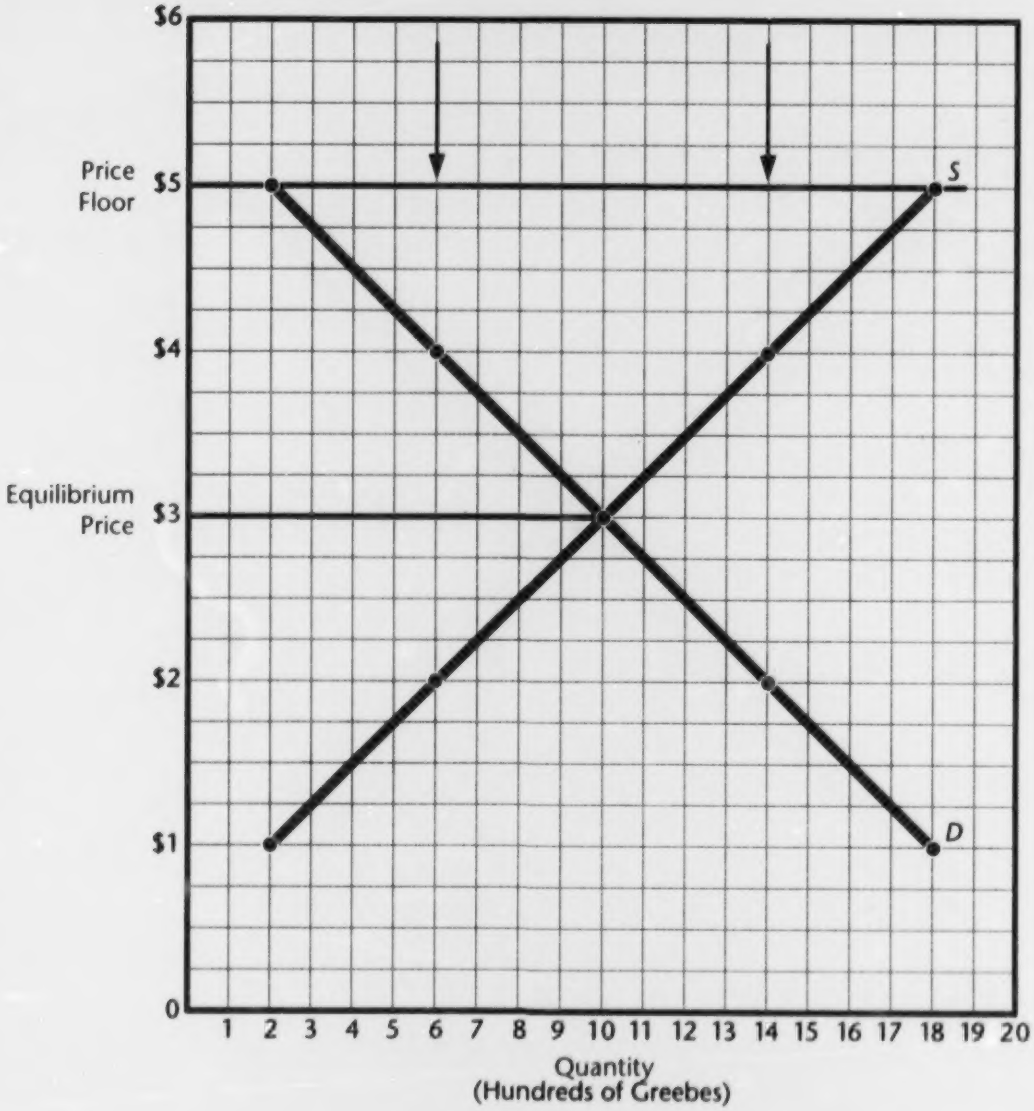
Visual 2.10

A Price Floor



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Microeconomics

Unit 3

The Theory of the Firm

25 Days

Unit Overview

The "theory of the firm" is the heart of a microeconomics course. The materials in this unit will account for forty to fifty-five percent of the AP microeconomics exam.

This material is difficult because it is abstract. This is why we have included exercises requiring students to plot costs and revenues before they interpret them. The risk in this approach is that students may get bogged down in details and miss the major theoretical conclusions. After completing this unit, students should be able to differentiate between short-run and long-run equilibria for both a profit-maximizing individual firm and for an industry. Students must understand the relationships among price, marginal revenue, average revenue, marginal cost, average cost, and profit. They also must be able to compare a monopolist's price, level of output, and profits with the price, level of output, and profits of a perfect competitor. Students must know why monopoly is bad and competition is good. This unit will help them evaluate government regulation of monopoly. Finally, students must understand the kinds of market structures that range between monopoly and perfect competition, specifically oligopoly and monopolistic competition.

This material may make more sense to students if they first study how businesses are organized (sole proprietorship, partnership, and corporation) and simple accounting. Material on the stock and bond markets might also be covered here. Most textbooks cover these topics. However, it is unlikely that there will be any AP questions on kinds of business organization, accounting, or financial markets.

Textbook Assignments

Baumol and Blinder, Chapters 9, 10, 11, 12

McConnell and Brue, Chapters 22, 23, 24, 25, 26

Miller, Chapters 22, 23, 24, 25, 26

Planning Ahead

Although the unit plan shows 25 days, this unit will probably take you longer. First, it is wise to start with an overview of business. In addition to examining the behavior and role of business in a capitalist economy, spend some time on income statements and balance sheets, stocks, bonds, and other financial instruments. This will make the cost and revenue curves in this unit more concrete. Baumol and Blinder cover most of these topics in Chapter 14, McConnell and Brue in Chapter 5, and Miller in Chapter 21. Second, try to bring in current controversies regarding the regulation of business. We have not included information about these topics because they rapidly become dated. Nevertheless, teaching students to evaluate controversial issues is a prime goal of an economics course.

There are several themes to keep in mind while students plow through this abstract material.

1. Firms should ignore sunk costs when making decisions. Why are marginal costs their primary consideration?
2. This material is based on the assumption that the objective of all firms is to maximize profits. Is this assumption correct?
3. Firms maximize profits where marginal revenue equals marginal cost. Why is this so?
4. When perfectly competitive firms maximize profits, the general good is served. Why? What are the implications of this?
5. When monopolies attempt to maximize profits, the general good is not served. Why? What are the implications of this?
6. Most U.S. markets can be classified as monopolistic competition or oligopoly. Why do we spend so much time on perfect competition and monopoly, forms of market structure that are rare?
7. What type of antitrust policy should government pursue? Why?

It pays to give frequent quizzes in this unit. If students do not understand costs, they will not be able to understand profit maximization. If they don't understand perfect competition, they will not understand monopoly. If this material is lost on the students, they will have difficulty passing the AP exam.

Unit 3 Activities

Activity 30	Different Types of Market Structure
Activity 31	Costs of the Individual Firm
Activity 32	An Introduction to Perfect Competition
Activity 33	Market Structure Crossword Puzzle
Activity 34	Costs and Competitive Market Supply (Perfect Competition)
Activity 35	Short-Run and Long-Run Competitive Equilibrium
Activity 36	Graphing Perfect Competition
Activity 37	Marginal Revenue for an Imperfect Competitor
Activity 38	Pure Monopoly
Activity 39	Monopoly Pricing
Activity 40	Let's Play Monopoly
Activity 41	Regulating Monopoly
Activity 42	Monopoly Consultants, Inc.
Activity 43	A Quick Review of Perfect Competition and Monopoly
Activity 44	Monopolistic Competition
Activity 45	Supply, Demand, and Videotape
Activity 46	The Kinked Demand Curve of an Oligopolist
Activity 47	From Monopolistic Competition to Oligopoly
Activity 48	Problems on Market Structure and Business

Unit 3 Visuals

Visual 3.1	Types of Market Structure
Visual 3.2	Total Fixed, Total Variable, and Total Costs
Visual 3.3	Marginal Product and Marginal Cost
Visual 3.4	Average Fixed, Average Variable, and Average Costs
Visual 3.5	The Perfectly Competitive Firm and Industry in Short-Run Equilibrium
Visual 3.6	Profit, Loss, and Shut-Down
Visual 3.7	The Perfectly Competitive Firm in Long-Run Equilibrium
Visual 3.8	How an Increase in Demand Changes Long-Run Equilibrium for the Firm and Industry
Visual 3.9	How a Decrease in Demand Changes Long-Run Equilibrium for the Firm and Industry
Visual 3.10	Price and Marginal Revenue for the Monopolist
Visual 3.11	The Profit-Maximizing Position of a Monopoly
Visual 3.12	Short-Run and Long-Run Equilibrium for a Monopolistic Competitor
Visual 3.13	The Kinked Demand Curve of an Oligopolist

Sample Unit 3 Plan

Week 1	**Week 2**
☐ 1. Explain why market structure is important. Why will students be doing all this work? 2. Provide an overview of characteristics of 4 types of market structure. 3. Have students complete Activity 30. 4. Use Visual 3.1 to discuss Activity 30. 5. Assign Baumol, Chap. 9; McConnell, Chap. 22; Miller, Chap. 22.	☐ Have the students complete the remainder of Activity 32 in class.
☐ 1. Lecture/discussion on costs of production using Visuals 3.2, 3.3, and 3.4. 2. Assign Activity 31 as homework.	☐ 1. Discuss the remainder of Activity 32. 2. Use Visual 3.6 to review perfect competition. 3. Assign Activity 33 as homework.
☐ 1. Discuss Activity 31. 2. Assign Baumol, Chap. 10; McConnell, Chap. 23; Miller, Chap. 23.	☐ 1. Go over Activity 33. 2. Use Visual 3.7 to illustrate long-run equilibrium for a perfect competitor. 3. Assign Part A of Activity 34.
☐ Give the students time in class to complete parts A–D of Activity 32. This reviews the costs of production.	☐ 1. Discuss Part A of Activity 34. 2. Have students do Part B of Activity 34.
☐ 1. Go over parts A–D of Activity 32. 2. Use Visual 3.5 to show the perfectly competitive firm.	☐ 1. Discuss the answers to Part B of Activity 34. 2. Use Visuals 3.8 and 3.9 to explain how the firm and industry reach long-term equilibrium.

SAMPLE UNIT 3 PLAN continued

Week 3	**Week 4**	**Week 5**
☐ 1. Have the students do Activity 35 in class and discuss it. 2. Assign Activity 36.	☐ 1. Discuss Activity 40. 2. Give a lecture on regulating monopoly. 3. Do Activity 41 in class. 4. Assign Activities 42 and 43.	☐ Discuss Activity 47.
☐ 1. Discuss Activity 36 and review perfect competition. 2. Assign Baumol, Chap. 11; McConnell, Chap. 24; Miller, Chap. 24.	☐ 1. Discuss Activities 42 and 43. 2. Assign Baumol, Chap. 12; McConnell, Chap. 25; Miller, Chap. 25.	☐ Have the students do Activity 48 in small groups.
☐ 1. Use Visual 3.10 to discuss the demand curve and MR curve of a monopolist. 2. Have students complete Activity 37 in class or as homework.	☐ 1. Use Visual 3.12 to describe the characteristics of monopolistic competition. 2. Have students complete Activity 44 in class. 3. Assign Activity 45.	☐ Discuss Activity 48.
☐ 1. Discuss Activity 37. 2. Use Visual 3.11 to explain the monopolist's profit-maximizing price and output. 3. Use Visual 3.11 to compare the output of a monopolist with that of a perfect competitor. 4. Assign Activity 38.	☐ 1. Discuss Activity 45. 2. Use Visual 3.13 to discuss the characteristics of an oligopoly. 3. Assign Activity 46.	☐ Review for test using Sample Multiple-Choice and Essay Questions.
☐ 1. Discuss Activity 38. 2. Do Activity 39 in class. 3. Assign Activity 40.	☐ 1. Discuss Activity 46. 2. Assign Activity 47.	☐ Unit Test.

UNIT 3, LESSON 1

An Introduction to Market Structure

Introduction and Description

This lesson introduces students to the kinds of market structures they will be studying during the next several weeks. Because most actual markets do not fit the assumptions of the perfectly competitive market model, it is necessary to examine what happens when these assumptions, such as perfect information and an industry consisting of many small firms, are violated. Economists have developed classifications and market models to explain how other market structures, such as those characterized by monopoly, oligopoly, and monopolistic competition, can produce results that differ from those expected under purely competitive conditions.

In this lesson, it is a good idea to point out that throughout the unit we will assume that firms want to maximize their profits. However, depending on the market structure of the industry, such behavior has greatly different effects on society and the economy. Stress that in this unit students will use models and analytical skills to examine the behavior and effect of firms operating under different types of market structure. As social scientists, students must support their conclusions.

Objective

Describe the major characteristics of *perfect competition, monopolistic competition, oligopoly,* and *monopoly*.

Time Required

- One class period

Materials

1. Activity 30
2. Visual 3.1

Procedure

1. Give a lecture on the characteristics of *perfect competition, monopolistic competition, oligopoly,* and *monopoly*.
2. Have the students form groups to complete Activity 30.
3. Use Visual 3.1 as the answer key to discuss the answers to Activity 30. Students may disagree on whether certain examples belong in one category of market structure or another. This may depend on how broadly they define the industry. For example, "canned food" might be monopolistic competition while "canned corn" might be oligopolistic. They may also bring up examples not on Visual 3.1 Stress that it is difficult to determine exactly the market structure in some industries. The real world is messy.
4. Ask questions such as the following to reinforce the students' understanding of the types of market structures:
    a. What is the difference between homogeneous and differentiated products? (Homogeneous products are identical; differentiated products differ in quality and type. Raw cane sugar is homogeneous; candy bars are differentiated.)
    b. What is the difference between perfect competition and monopolistic competition? (Under monopolistic competition, products are differentiated, and competition takes place in terms of both price and quality. In perfect competition, products are identical, and market forces set the price.)
    c. Is monopolistic competition close to monopoly? (No, it is closer to perfect competition because it has many firms.)
    d. What are the main characteristics of oligopoly? (There are few firms, the ability to influence price, barriers to entry.)
    e. What are some examples of barriers to entry? (There are large advertising costs, patents, licenses, large capital investment.)
    f. What is the distinguishing characteristic of monopoly? (Only one supplier in an industry or in a particular geographic area or in a particular market in which other suppliers are unable to compete.)

Lesson developed by Jerry DeYoung, Riverbank High School, Riverbank, CA, and Ken Hill, Hanford Joint Union High School, Hanford, CA

ACTIVITY 30 **ANSWER KEY**
Different Types of Market Structure

After you have learned about the four types of market structure, complete the chart below.

Types of Market Structure

Market Structure	Number of Firms	Differentiated or Homogeneous Product	Ease of Entry	Price-Setting Power	Non-Price Competition	Examples
Perfect Competition	**many**	**homogeneous**	**free or easy**	**none—price taker**	**none by firm**	**wheat, corn beef, and other agricultural products**
Monopolistic Competiton	**many**	**differentiated**	**relatively easy**	**some discretion—mostly determined by market**	**some**	**fast food, gas, and other retail stores**
Oligopoly	**few**	**homogeneous or differentiated**	**substantial barriers**	**price leadership—some discretion**	**extensive**	**steel, beer, aluminum, cereal, cars, soft drinks, soap**
Monopoly	**one**	**only product of its kind available**	**blocked**	**complete control**	**firm's image—public relations**	**utilities, local phone service**

UNIT 3, LESSON 2

The Costs of Production

Introduction and Description

This lesson helps students understand several basic cost concepts. Although there are four types of market structure, the costs of the firm remain conceptually the same for each. Unless students understand these cost concepts, they will be confused during the entire unit. For this reason, these concepts are repeated as part of Lesson 3.

First, this lesson includes the application of opportunity costs (including implicit costs) to determine economic profit. Second, students learn the interrelationships among these costs. Third, they learn how to graph cost curves in order to see more clearly how the costs are related to each other.

Objectives

1. Use explicit and implicit costs to determine economic profit and loss.
2. Define and graph *total fixed cost* (FC), *total variable cost* (VC), and *total cost* (TC).
3. Define and graph *average fixed cost* (AFC), *average variable cost* (AVC), *average total cost* (ATC), and *marginal cost* (MC).
4. Calculate AFC, AVC, ATC, and MC given a schedule of the quantity of output and fixed and variable costs at each output level.
5. Explain why MC = ATC at the minimum ATC level.
6. Explain why fixed cost is unrelated to marginal cost.
7. Explain how increasing marginal costs are related to decreasing marginal product.
8. Explain how the law of diminishing marginal returns affects costs.

Time Required

- Two class periods

Materials

1. Activity 31
2. Visuals 3.2, 3.3, and 3.4

Procedure

1. Discuss the ideas of revenues, costs, and profits. Give several easy examples of a firm's revenues, costs, and profits.
2. Define and discuss *implicit costs* and *explicit costs*. Relate these to accounting profit and economic profit.
3. Use Visual 3.2 to define and show the relationships among FC, VC, and TC.
4. Use Visual 3.3 to show the relationship of marginal product to marginal cost and average product to average variable cost. Discuss how the law of diminishing marginal returns affects costs and the significance of this effect.
5. Use Visual 3.4 to define and show the relationships among AFC, AVC, ATC, and MC.
6. Also use Visual 3.4 to explain why MC crosses ATC at its minimum point.
7. Assign Activity 31 as homework. Here are some things that the students should look out for.
    a. In Part A, the return on investment is a loss when opportunity cost is included. This gives a negative rate of return if "psychic income" from being in business for yourself is ignored.
    b. In Part B, marginal cost is plotted at the midpoints of the quantity intervals, and the quantity intervals are 100 units, not one unit. This is why there is a "ΔTC" column under the aggregate cost data. The ΔTC column is useful here because the quantity of output increases by increments of 100. Marginal cost then is ΔTC/ΔQ or ΔTC/100. To find MC as output increases from 500 units to 600 units, find the change in total cost over this interval: $4,600 – $3,600 = $1,000. Divide by the change in quantity (100), and MC = $10 at an output of 550 units. The complete steps for all intervals are:

1) Begin with the schedule of total cost at each output level.
2) Calculate the change in total cost, ΔTC, over the output interval.
3) Calculate the change in the number of units of output over the output interval, ΔQ.
4) Divide ΔTC by ΔQ: $MC = \frac{\Delta TC}{\Delta Q}$
5) Plot at the midpoint of the output interval.

8. Go over Activity 31. Here are some points to consider as you go over the answers. (See also the Answer Key for Activity 31.)

   a. The accountant's concept of "profit" differs from the economist's because the economist's concept includes implicit opportunity costs. When M.I. Fortunate goes into business for herself, she incurs two implicit opportunity costs.

   1) Her former salary of $50,000.

   2) The eight percent return on $100,000, which is $8,000.

   The second is incurred because the $100,000 must be used to invest in the new business. While it earns some return, it does not earn the previous $8,000 realized when it was invested in securities. The "net income" of $55,000 is gross return net of explicit cost only, and it gives an accounting profit only. To find economic profit, the opportunity cost of $58,000 must also be subtracted.

   The possibility of "psychic income" from being in business for herself is not considered in establishing her total income of $55,000 after all expenses. If "psychic income" is considered, she may not lose $3,000.

   b. Part B. Students must use these formulas:

   Total Cost = Fixed Cost + Variable Cost

   $$\text{Average Fixed Cost (AFC)} = \frac{\text{Fixed Cost}}{\text{Quantity}} = \frac{FC}{Q}$$

   $$AVC = \frac{VC}{Q}$$

   $$ATC = \frac{TC}{Q}$$

   $$\text{Marginal Cost} = \frac{\text{Change in Total Cost}}{\text{Change in Quantity}} = \frac{\Delta TC}{\Delta Q}$$

   c. In plotting, note the comments above and the points already provided on the marginal cost curve for outputs of 400 units and 500 units.

   d. Question 6 answer. A minimum is the lowest point. If $\frac{TC}{Q}$ and $\frac{VC}{Q}$ fall when MC is below (as they must since lower additional cost pulls average cost down) and if $\frac{TC}{Q}$ and $\frac{VC}{Q}$ increase when MC is above (as they must since higher additional cost pulls average cost up) and if MC is rising, $\frac{TC}{Q}$ and $\frac{VC}{Q}$ must be at a minimum when they are equal to MC since you have to pass through a minimum when you stop falling and start rising.

ACTIVITY 31 **ANSWER KEY**
Costs of the Individual Firm

Part A.
Fill in the blanks and answer the questions.

1. M.I. Fortunate was employed as plant manager for a corporation at a salary of $50,000 a year, and she had savings of $100,000 invested in securities that yielded an eight percent annual income. She went into business for herself, investing all her savings in the enterprise. At the end of the first year, her accounts showed a net income of $55,000 after all expenses of operation. One accountant said this accounting profit represented a 55 percent return on her $100,000 investment. Another accountant, who had taken introductory microeconomics, said, "No, you should pay yourself the $50,000 salary you would have earned anyway, and your accounting profit of $5,000 represents a return of five percent on your investment of $100,000." A serious student of introductory microeconomics, however, should say, "No, your true economic profit from going into business for yourself is $ **-3,000**, and this is a return of **-3.0** percent." Was M.I. Fortunate, fortunate? Yes or No and why?

   No. The forgone salary of $50,000 and the forgone interest income of $8,000 are opportunity costs so going into business on her own costs her $3,000. But she might not view this as a loss if she gets "psychic income" from self employment.

2. The table *Aggregate and Unit Cost Structure* on the following page shows a comprehensive set of cost data for a firm, with a given plant, at various levels of output. Study this table to understand how it is set up.

   Marginal cost is the *additional* cost of producing an *additional* unit of output ($\Delta C/\Delta Q$). If producing an additional 100 units of output adds $700 to total cost, the marginal cost per unit is $700/100 = $7.00, etc. Note that in the table the "marginal" changes are located between output levels.

   After you have filled in the blanks in the table, finish plotting the aggregate cost data for fixed cost, variable cost, and total cost (*not* change in total cost) on the *Graph of Aggregate Cost Data* provided on page 113. Also, finish plotting the unit cost data for FC/Q, VC/Q, TC/Q and $\Delta TC/\Delta Q$ on the *Graph of Unit Cost Data* provided on page 114. Note that marginal cost ($\Delta TC/\Delta Q$) is plotted midway between the levels of output given in first column of the table *Aggregate and Unit Cost Structure*.

3. After you have finished plotting, answer the eight questions that follow in Part B.

ACTIVITY 31 ANSWER KEY continued

Aggregate and Unit Cost Structure

Aggregate Cost Data					Unit Cost Data				
Quantity of Output	Fixed Cost (FC)	Variable Cost (VC)	Total Cost (TC)	Change in Total Cost (ΔTC)	Average Fixed Cost $\frac{FC}{Q}$	Average Variable Cost $\frac{VC}{Q}$	Average Total Cost $\frac{TC}{Q}$	Marginal Cost $\frac{\Delta TC}{\Delta Q}$	Plot MC at Output
0	$500	$0	$500		XXX	XXX	XXX	XXX	
				$700				$7.00	50
100	500	700	1200		$5.00	$7.00	$12.00		
				600				6.00	150
200	500	1300	**1,800**		2.50	6.50	9.00		
				500				5.00	250
300	**500**	**1,800**	2300		1.67	6.00	**7.67**		
				700				7.00	350
400	**500**	2500	**3,000**		1.25	6.25	7.50		
				800				8.00	450
500	500	3300	3800		**1.00**	6.60	**7.60**		
				1,000				**10.00**	550
600	500	4300	4800		.83	7.17	8.00		
				1,200				12.00	650
700	**500**	5500	6000		.71	7.86	**8.57**		

Part B.

Plot the appropriate data from the table on the graphs *Aggregate Cost Data* and *Unit Cost Data* on pages 113 and 114 before answering the eight questions that follow.

1. How is marginal cost (ΔTC/ΔQ) represented in your graph *Aggregate Cost Data*?
   It is the slope of the TC curve.

2. On your graph *Unit Cost Data*, total cost per unit (TC/Q or average total cost) is at a minimum at an output level of **400** units.

3. On your graph *Unit Cost Data*, variable cost per unit (VC/Q or average variable cost) is at a minimum at an output level of **300** units.

4. On your graph *Unit Cost Data*, what is the relation between marginal cost (ΔTC/ΔQ) and average total cost (TC/Q) when average total cost is at its minimum?
   They are equal.

5. On your graph what is the relation between marginal cost (ΔTC/ΔQ) and average variable cost (VC/Q) when average variable cost is at its minimum?
   They are equal.

6. Explain why marginal cost on a unit cost graph always intersects average total cost and average variable cost at their minimum points.
   A minimum is the lowest point.
   If ATC($\frac{TC}{Q}$) and AVC($\frac{VC}{Q}$) fall when MC($\frac{\Delta TC}{\Delta Q}$) is below (as they must since the cost of one additional unit is less than the average, it pulls average cost down), and if ATC and AVC increase when MC is above (as they must since

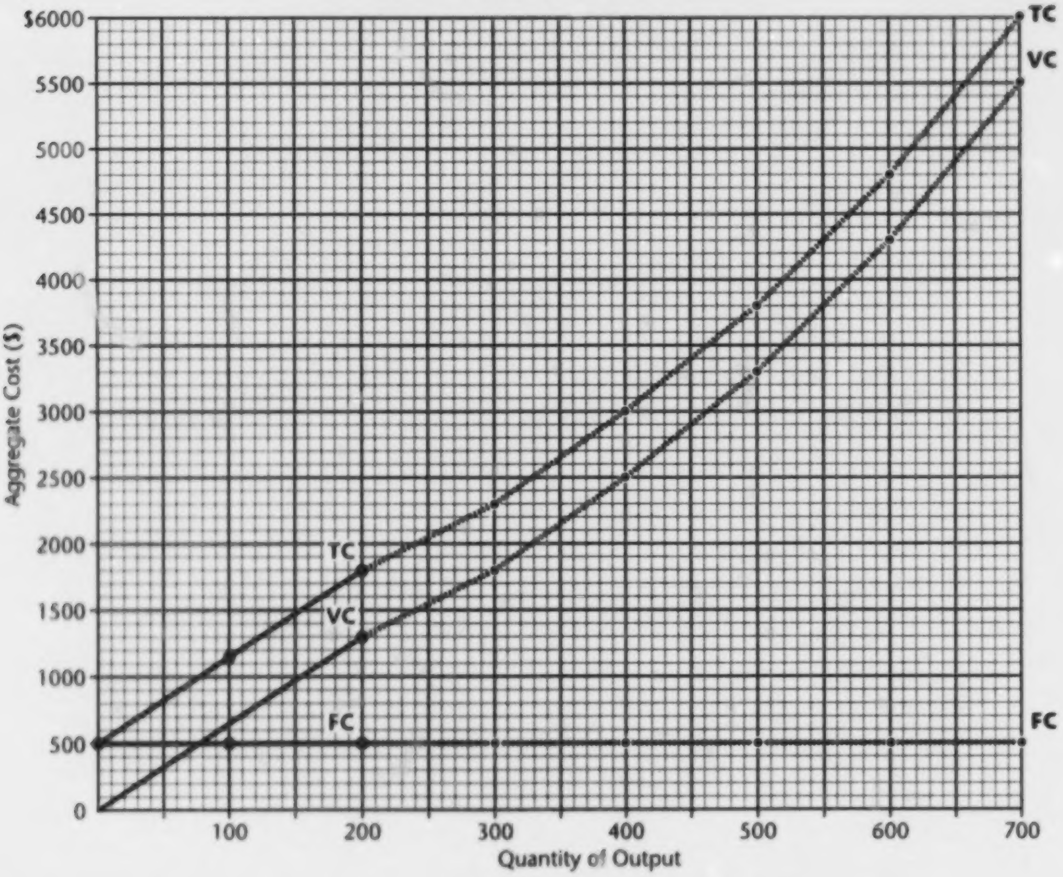
ACTIVITY 31 ANSWER KEY continued

the cost of one additional unit is more than the average, it pulls average cost up), and if MC is rising, ATC and AVC must be at a minimum when they are equal to MC since you have to pass through a minimum when you stop falling and start rising. Let's say that a basketball player is averaging ten points a game. In the next game, she scores eight points. Because the marginal (additional) points are less than her average, her average must fall. On the other hand, what if she scored twelve points? Then her average would rise because the marginal points would be greater than her average.

7. On your graph *Unit Cost Data,* what does the vertical distance between the TC/Q curve and VC/Q curve represent? $\frac{FC}{Q}$ **or average fixed cost.**

8. Explain why fixed cost has no influence on marginal cost.
Fixed cost, by definition, does not change as output changes. Marginal cost, by definition, is the change in total cost as output changes. Therefore, fixed cost, which does not change, can have no influence on the changes in cost measured by marginal cost.

Graph of Aggregate Cost Data

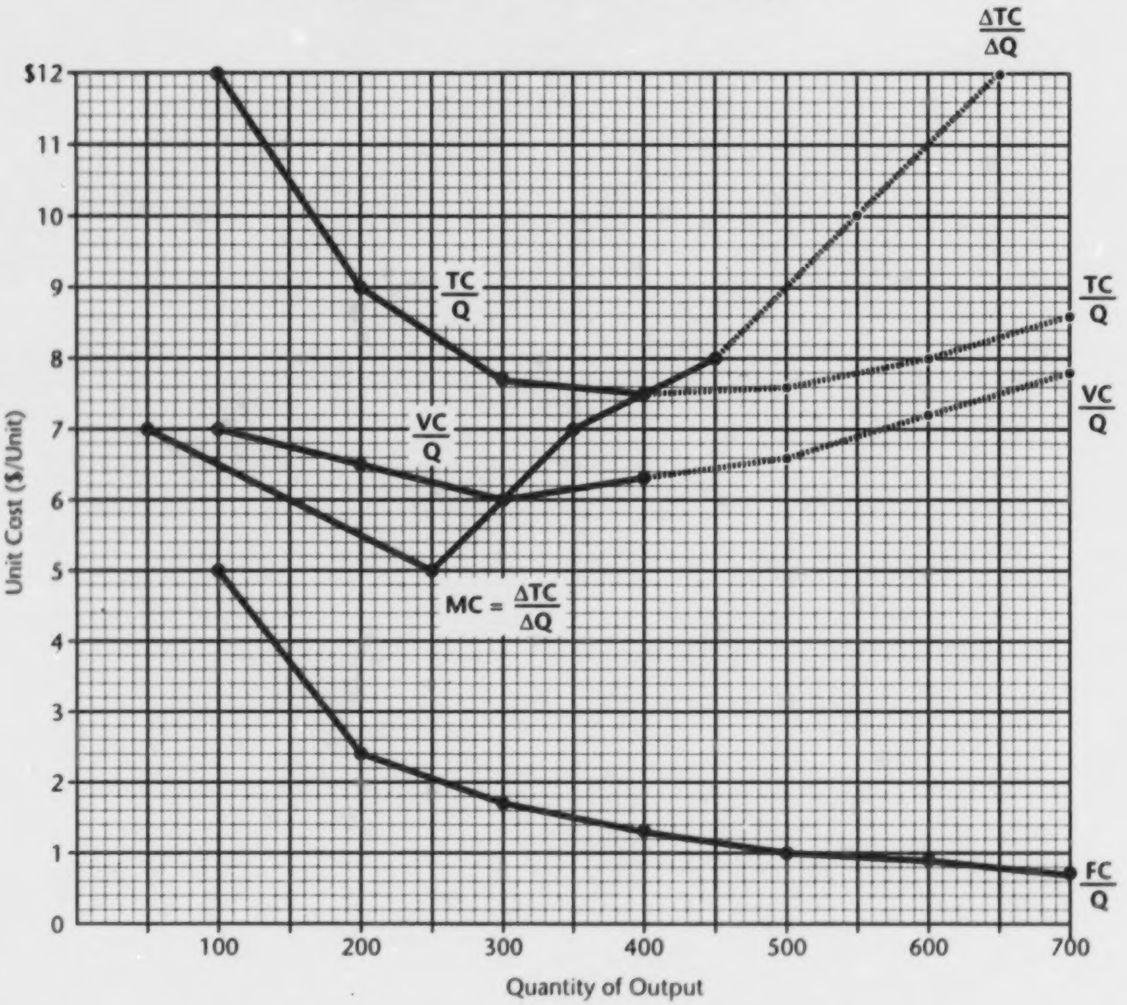


Note: Each small square = $100 on the vertical axis and 10 units of output on the horizontal axis.

ACTIVITY 31 ANSWER KEY continued

Graph of Unit Cost Data

Marginal cost (ΔTC/ΔQ) is plotted between the output levels shown in the table *Aggregate and Unit Cost Structure* on page 112.



Note: Each small square = $.20 on the vertical axis and 10 units of output on the horizontal axis.

UNIT 3, LESSON 3

Perfect Competition in the Short Run

Introduction and Description

This lesson is designed to help students understand the profit-maximizing output of the perfectly competitive firm. Any firm maximizes profits where marginal revenue equals marginal cost. For a perfectly competitive firm, marginal revenue is equal to the price it receives for selling its product. This is because there are so many firms producing a homogeneous product that no one firm can influence the price. Therefore, a perfectly competitive firm maximizes profits where price equals marginal cost.

Activity 32 reinforces the cost concepts learned in Lesson 2 and then adds the price and revenue concepts. Activity 33 is a review of the extensive vocabulary students must learn in this unit. All the terms have been covered in Lessons 1-3.

Objectives

1. List the conditions that must be fulfilled if an industry is to be perfectly competitive.
2. Explain why for a perfectly competitive firm, price, marginal revenue, and demand are equal.
3. Compute and graph price, average revenue, and marginal revenue when given the demand schedule faced by a perfectly competitive firm.
4. Explain the profit-maximizing rule for a perfect competitor and state the reasons that this rule works.
5. Given data, determine the price and output of a perfectly competitive firm in the short run.
6. Given data, determine the break-even and shut-down points for a perfect competitor.

Time Required

- Two class periods

Materials

1. Activities 32 and 33
2. Visuals 3.5 and 3.6

Procedure

1. Use Visual 3.5 to show the perfectly competitive firm in a short-run position. Ask questions such as these:
    a. How is the price at which the firm sells established?
    b. How much control does the firm have over this price?
    c. Why do we say a perfect competitor is a "price taker"?
    d. Why does a perfect competitor maximize profits where Price = MC?
    e. Is this perfect competitor making a profit? Why or why not?
2. Have the students do Parts A–D of Activity 32, and discuss the answers. This section of Activity 32 is a review of costs.
3. Have the students complete the rest of Activity 32, and discuss it.
4. Now use Visual 3.6 to summarize what they have learned.
    a. At what output will the firm operate at price P_5? Will it make a profit?
    b. At price P_4, will the firm make a profit, break even, or have an economic loss? What does it mean to "break even"?
    c. At P_3, will the firm make a profit, break even, or have an economic loss? Will it continue to produce? Why or why not?
    d. At P_2, will the firm make a profit, break even, or have an economic loss? Will it continue to produce? Why or why not?
5. As a review, assign Activity 33. You can go over the answers, make a visual of the answer key, or hand out the answer key. By this time, students should be very familiar with the terminology.

ACTIVITY 32 **ANSWER KEY**
An Introduction to Perfect Competition

This activity explains how businesses operate and how their operation affects society. To accomplish the explanation, it is necessary to look at business costs and revenues. This analysis is based on the assumption that the object of any business is to maximize profits.

Part A. Definitions of Costs.
Define on this sheet the following terms.

1. Average fixed cost (AFC) **Fixed cost ÷ output.**
2. Average total cost (ATC) **Total cost ÷ output.**
3. Average variable cost (AVC) **Variable cost ÷ output.**
4. Economic cost **Any cost that must be made to obtain and use a resource.**
5. Economic profit **The amount of a firm's total revenue that exceeds all its economic cost including both explicit and implicit costs.**
6. Explicit cost **The money payment a firm must make to an outsider to obtain and use a resource.**
7. Fixed cost (FC) **A cost that does not change with output.**
8. Implicit cost **The money income a firm sacrifices when it employs a resource it owns rather than selling it to someone else.**
9. Law of diminishing marginal returns **As equal amounts of variable resources are added to a fixed resource, eventually the marginal product (extra output) will decline.**
10. Long run **A period of time long enough to change all costs. All costs are variable in the long run.**
11. Marginal cost (MC) **The extra cost of producing one more unit of output.**
12. Normal profit **A measure of the opportunity cost of capital; a profit that is equal to a firm's implicit costs; the minimum profit needed to stay open in the long run.**
13. Short run **A period of time when at least one cost is fixed; when existing firms can increase the quantity of their output with their existing plants.**
14. Total cost (TC) **All of the costs of the firm: fixed and variable costs.**
15. Variable cost (VC) **A cost that increases as output increases.**

ACTIVITY 32 ANSWER KEY continued

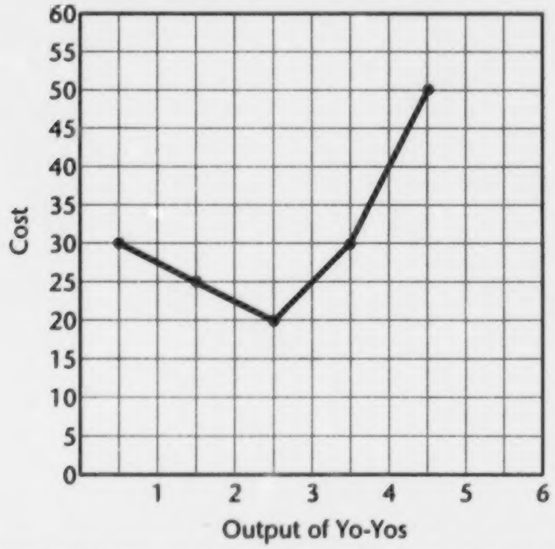
Part B. Marginal Cost Problem.
Fill in the blanks.

Output, Total Cost, and Marginal Cost

Output	Total Cost (TC)	Marginal Cost (MC)
0	55	
1	85	**30**
2	110	**25**
3	130	**20**
4	160	**30**
5	210	**50**

Part C. Graphing Problem.
Graph these marginal costs on the graph *Plotting Marginal Cost of Yo-Yos*. MC is on the vertical axis, and output of yo-yos is on the horizontal axis. Plot MC between output levels.

Plotting Marginal Cost of Yo-Yos



1. What is the relationship between MC and output as shown on your graph?
   Marginal cost decreases and then rises as output increases.

2. Explain why MC falls and then rises as output increases.
   Increasing returns followed by diminishing returns.

ACTIVITY 32 ANSWER KEY continued

Part D. Charting and Graphing Costs.

Complete the chart *Fixed and Variable Costs of Yo-Yos*. Assume that the firm has a total fixed cost (FC) of $60 and total variable costs (VC) as shown below. Part of the chart has been completed for you.

Fixed and Variable Costs of Yo-Yos

Total Product	FC	VC	TC	MC	AFC	AVC	ATC
0	$60	0	$60		---	---	---
				$45			
1	$60	$45	$105		$60.00	$45.00	$105.00
				$40			
2	$60	$85	$145		$30.00	$42.50	$72.50
				$35			
3	**$60**	$120	**$180**		**$20.00**	**$40.00**	**$60.00**
				$30			
4	**$60**	$150	**$210**		**$15.00**	**$37.50**	**$52.50**
				$35			
5	**$60**	$185	**$245**		**$12.00**	**$37.00**	**$49.00**
				$40			
6	**$60**	$225	**$285**		**$10.00**	**$37.50**	**$47.50**
				$45			
7	**$60**	$270	**$330**		**$8.57**	**$38.57**	**$47.14**
				$55			
8	**$60**	$325	**$385**		**$7.50**	**$40.63**	**$48.13**
				$65			
9	**$60**	$390	**$450**		**$6.67**	**$43.33**	**$50.00**
				$75			
10	**$60**	$465	**$525**		**$6.00**	**$46.50**	**$52.50**

1. Graph FC, VC, and TC on the graph *Total Variable, Total Fixed, and Total Costs*, on page 121. Graph all three cost curves on one graph. Cost is on the vertical axis, and output of yo-yos is on the horizontal axis. Label each curve.

   a. What is the difference between fixed and total costs?
   Variable cost.

   b. Why does VC rise as output increases?
   It costs more to produce more.

   c. Why is FC a horizontal line?
   It is a constant; it is not affected by output.

   d. Why does the TC curve have the same slope as the VC curve?
   Because the difference between the two is fixed cost, which is a constant.

ACTIVITY 32 ANSWER KEY continued

2. Graph AFC, AVC, ATC, and MC on the graph *Plotting Average Fixed, Average Variable, Average Total and Marginal Costs* on page 122. Graph all four cost curves on one graph. Cost is on the vertical axis, and output of yo-yos is on the horizontal axis. Label each cost curve.

   a. What happens to AFC as output rises? Why?
   It falls because a constant (total fixed cost) is divided by a greater output.

   b. What happens to AVC as output rises? Why?
   It falls and then rises because of increasing outputs followed by diminishing returns.

   c. What happens to ATC as output rises? Why?
   It falls and then rises because of increasing outputs followed by diminishing returns.

   d. What happens to MC as output rises? Why?
   It falls and then rises because of increasing outputs followed by diminishing returns.

   e. At what unique point does marginal cost cross AVC and ATC? Why?
   At their lowest point. If MC is less than ATC, ATC must fall. If MC is greater than ATC, ATC must rise. The same is true of the AVC and MC relationship.

   f. Why is MC the same whether computed from TC or VC?
   Fixed cost is the difference between TC and VC, and it is a constant. MC is the variable cost of the last unit produced.

ACTIVITY 32 ANSWER KEY continued

Part E. Definitions of Revenue.

Define on this sheet the following terms.

1. Total revenue (TR)

   The total number of dollars received by a firm from the sale of a product.

2. Marginal revenue (MR)

   The change in total revenue for a firm that results from the sale of one additional unit of its product.

3. Average revenue (AR)

   Total revenue divided by units sold. This is also the price of the product.

Part F. Marginal Revenue Problem.

The following is a revenue schedule for a perfectly competitive firm. Fill in the blanks.

Revenue Schedule for a Perfectly Competitive Firm

Price	Quantity	TR	MR
$10	1	$10	
			$10
$10	2	$20	
			$10
$10	3	$30	
			$10
$10	4	**$40**	

1. What generalization can you make about price and marginal revenue under perfect competition?
   They are all the same.

2. Why doesn't the perfect competitor lower the price to sell more?
   The seller is not large enough to affect the market; it is a price taker. Perfect competitors can sell all they want at the market price, so they have no incentive to lower price.

3. What determines the price at which the perfect competitor sells the product?
   Market supply and market demand for the product.

ACTIVITY 32 ANSWER KEY continued

Part G. Pricing under Perfect Competition.

1. Graph prices of $32, $45, and $56 on the graph *Plotting Average Fixed, Average Variable, Average Total and Marginal Costs* on page 122. (Hint: Each price is a horizontal line.)

2. At a price of $56:
   a. How many yo-yos will the firm product in the short run? **7½** Why? (NOTE: Assume you can produce part of a yo-yo.)
   This is where price equals marginal cost. The firm's profit will be greatest here.

   b. Will the firm earn an economic profit or have an economic loss? **profit**
   How much will the approximate profit or loss per unit be? **$8 ($56 – $48)**
   How much will the approximate total profit or loss be? **$60 ($8 x 7.5)**

3. At a price of $45:
   a. How many yo-yos will the firm produce in the short run? **6½** Why?
   This is where price equals marginal cost. The firm will minimize its losses here. This is the best it can do.

   b. Will the firm earn an economic profit or have an economic loss? **loss**
   How much will the approximate profit or loss per unit be? **$2 ($47 – $45)**
   How much will the approximate total profit or loss be? **$13 ($2 x 6.5)**

   c. Will this yo-yo firm stay open or shut down in the short run? **Stay open**
   Why? **As long as a firm earns enough to cover all of its variable costs and part of its fixed cost, it should stay open. It loses less staying open than shutting down.**

4. At a price of $32:
   a. How many yo-yos will this firm produce in the short run? **0** Why?
   It loses more money producing at its maximum profit point of 4 units than by shutting down.

   b. Will this firm stay open or shut down in the short run? **Shut down** Why?
   The maximum profit or loss-minimizing point is 4 and not 3 because marginal cost is falling at 3.

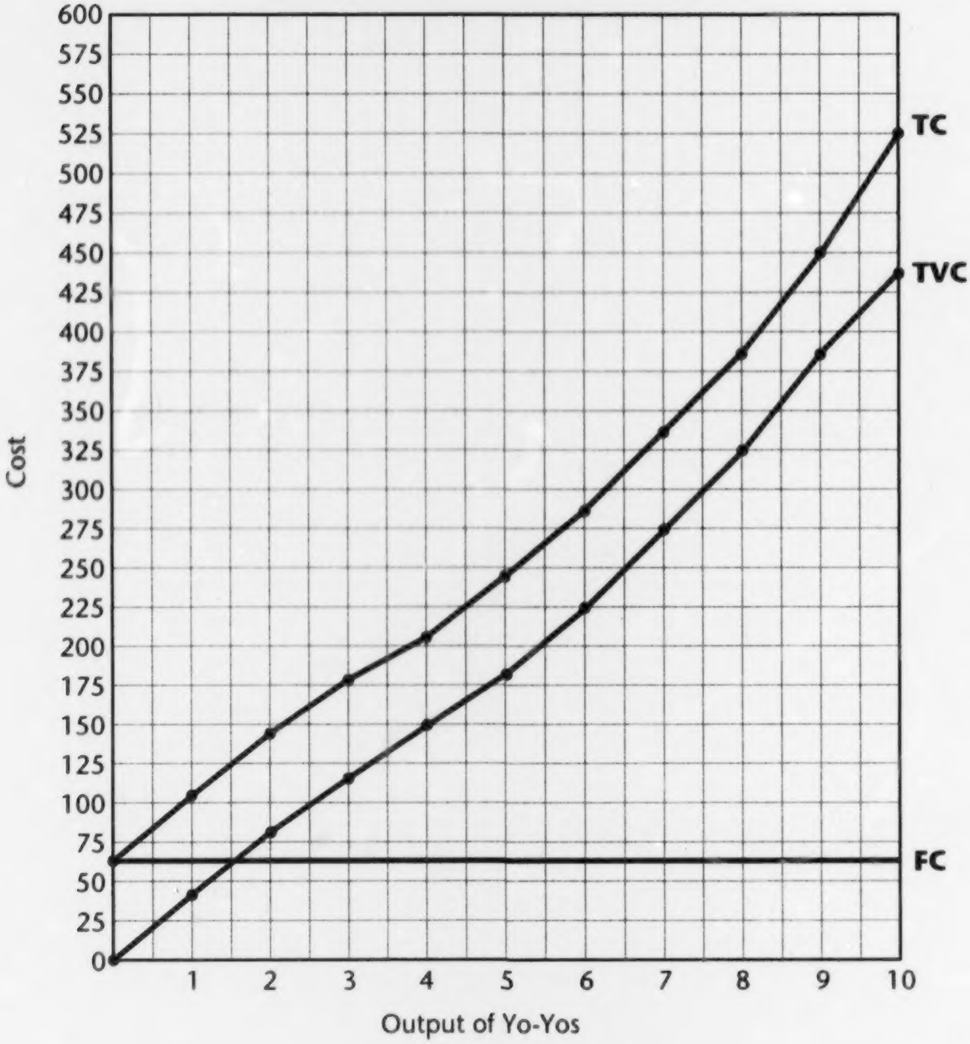
5. Why will a firm maximize its profits or minimize its losses at the output where MR (price) equals MC? **If MR is greater than MC, the firm can add to profit by producing one more good. If MC is greater than MR, the firm would subtract from profit by producing one more good. The firm maximizes profit where MR = MC because it has passed all positions where MR > MC.**

6. Why are price and MR the same for a perfect competitor?
   A perfect competitor sells every good at the same price.

7. Why is a perfect competitor called a "price taker"?
   A perfect competitor can take the price or reject it. A perfect competitor cannot change the market price because the firm is too small to exercise any price control.

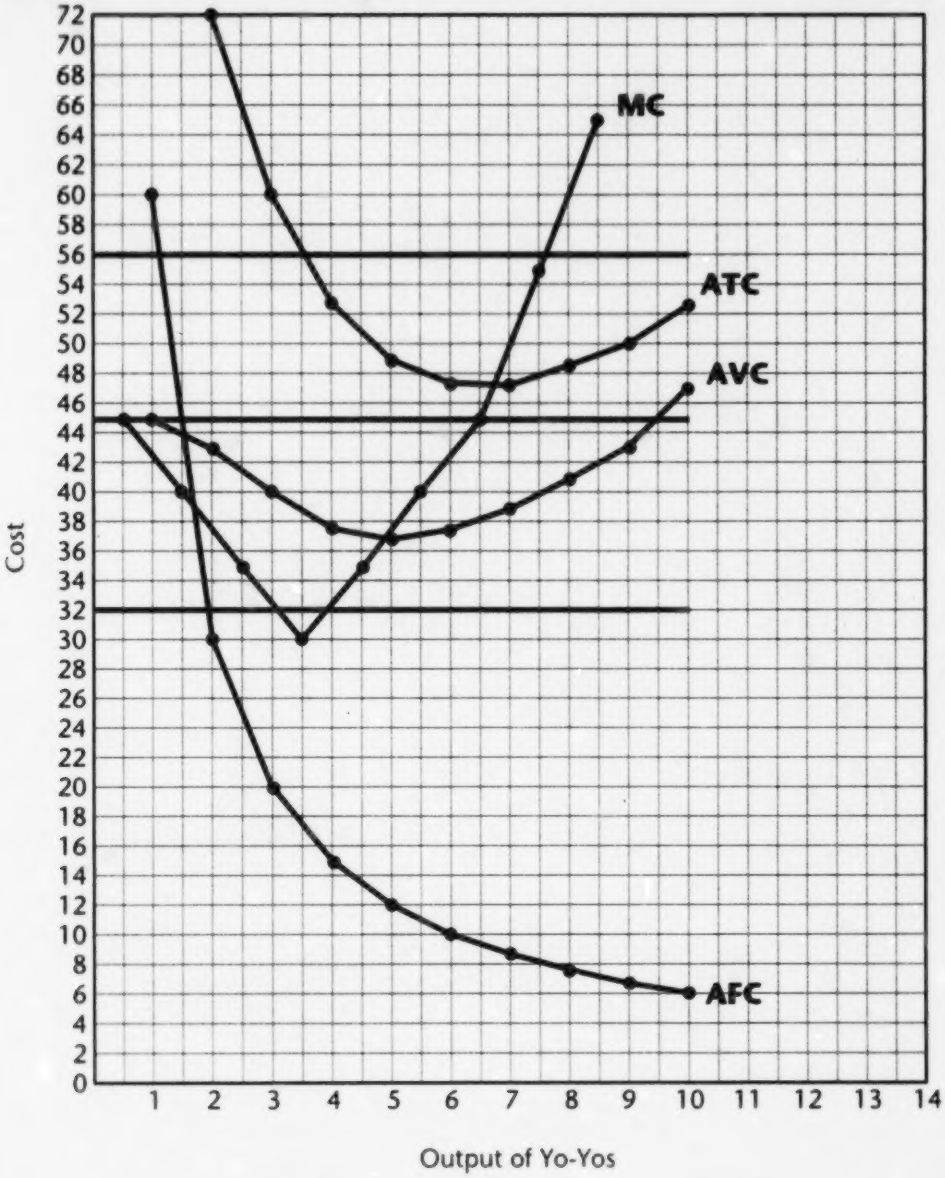
ACTIVITY 32 ANSWER KEY continued

Total Variable, Total Fixed, and Total Costs



ACTIVITY 32 ANSWER KEY continued

Plotting Average Fixed, Average Variable, Average Total and Marginal Costs



ACTIVITY 33 **ANSWER KEY**
Market Structure Crossword Puzzle

1 E	X	P	L	I	C	I	T	▨	2 O	L	I	G	O	P	O	3 L	Y
C	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	A	▨
O	▨	4 F	5 I	X	E	D	▨	▨	▨	▨	▨	▨	▨	▨	▨	W	▨
N	▨	▨	M	▨	▨	▨	▨	▨	▨	▨	6 D	E	M	A	N	D	▨
O	▨	▨	P	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	I	▨
M	▨	▨	7 L	O	N	G	R	U	8 N	▨	▨	▨	9 M	▨	▨	10 M	C
I	▨	▨	I	▨	▨	▨	▨	▨	O	▨	▨	▨	O	▨	▨	I	▨
C	▨	▨	C	▨	▨	11 S	H	O	R	T	R	U	N	▨	▨	N	▨
P	▨	▨	I	▨	▨	U	▨	▨	M	▨	▨	▨	O	▨	▨	I	▨
R	▨	▨	T	▨	▨	P	▨	▨	12 A	V	C	▨	P	▨	▨	S	▨
O	▨	▨	▨	▨	▨	P	▨	▨	L	▨	▨	▨	O	▨	▨	H	▨
F	▨	▨	▨	▨	▨	L	▨	▨	P	▨	▨	▨	L	▨	▨	I	▨
I	▨	▨	▨	▨	▨	Y	▨	▨	R	▨	▨	▨	Y	▨	▨	N	▨
13 T	O	T	A	L	▨	▨	▨	▨	O	▨	▨	14 P	▨	▨	▨	G	▨
▨	▨	▨	▨	▨	▨	▨	▨	▨	F	▨	15 A	R	▨	▨	▨	▨	▨
▨	▨	▨	16 E	C	O	N	O	M	I	C	▨	I	▨	▨	▨	17 A	▨
▨	▨	18 M	▨	▨	▨	▨	▨	▨	T	▨	▨	C	▨	▨	▨	T	▨
19 V	A	R	I	A	B	L	E	▨	▨	▨	20 P	E	R	F	E	C	T

Across

1. Another name for accounting costs
2. Market structure in which there are only a few producers
4. A cost that does not change as production increases or decreases
6. The amount consumers are willing and able to buy at each price per unit of time
7. The time period during which the size of the plant may be altered and all costs are variable (2 words)
10. The change in the total cost due to a change of one unit of production (abbr.)
11. The time period in which a firm cannot alter its plant size (2 words)
12. Total variable costs divided by the number of units produced (abbr.)
13. Fixed cost and variable cost together
15. Total revenue divided by the total number of units produced (abbr.)
16. Any goods that are scarce
19. Costs that increase and/or decrease with changes in production
20. Market structure in which the decisions of individual buyers and sellers have no effect on the market price because there are so many of each

Down

1. Revenue remaining after all implicit and explicit costs have been paid (2 words)
3. When one additional unit of input produces less output than the previous unit of input, the _____ of __________ returns has taken effect. (2 words)
5. The costs of owner-provided capital and labor
8. What an entrepreneur obtains when just meeting the explicit and implicit costs (2 words)
9. Market with only one firm
11. The amount producers are willing and able to provide at each price level per unit of time
14. The firm operating in perfect competition is called a _____ taker.
17. Total cost divided by the number of units produced (abbr.)
18. The change in total revenue by the production and sale of one unit of the product (abbr.)

UNIT 3, LESSON 4

Perfect Competition: Short-Run and Long-Run Equilibrium

Introduction and Description

In Lesson 3, students learned that in the short run, a perfectly competitive firm will maximize its profit where price equals marginal cost. In the short run, the perfectly competitive firm may make a profit, have a loss, or break even.

We now move on to Lesson 4 and examine one of the key points in the theory of the firm. This lesson compares short-run equilibrium with long-run equilibrium. In the long run, a perfectly competitive firm will earn a normal profit—break even. The perfectly competitive firm will produce where price equals marginal cost equals average total cost. In long-run equilibrium, a perfectly competitive firm is allocatively and productively efficient. This is terrific for the economy and explains why competitive markets work to the consumer's advantage.

This lesson also emphasizes why a perfectly competitive firm in long-run equilibrium produces where P = MC = ATC. If a firm makes an economic profit in the short run, more firms enter the industry and the price decreases. If a firm has short-run economic losses, it will exit the industry, and the price increases. This process has been covered in the AP essay questions several times, each time with a different twist.

Finally, students tend to confuse the behavior of a single firm with the behavior of the industry. The industry consists of all firms and is illustrated with market supply and demand curves. The firm is a very small part of the industry, and it is illustrated with revenue and cost curves.

Objectives

1. Given data, determine the price and the output of the individual firm and of the industry in the short run and in the long run.
2. Describe how the entry and exit of firms bring about long-run equilibrium.
3. Evaluate the implications of a long-run equilibrium where P = MC = ATC.
4. Derive the firm's short-run supply schedule from cost schedules.
5. Calculate the firm's economic profit at a given price.
6. Describe the long-run adjustment of the firm and the industry to short-run economic profits and losses.
7. Describe the long-run supply schedules for constant cost and increasing cost industries.
8. Evaluate the advantages and shortcomings of a perfectly competitive market.

Time Required

- Four class periods

Materials

1. Activities 34, 35, and 36
2. Visuals 3.7, 3.8, and 3.9

Procedure

1. Use Visual 3.7 to illustrate long-run equilibrium for a perfect competitor. Emphasize these points:
   a. The market price is determined by supply and demand in the industry.
   b. Once the price is established, every firm must sell at that price or not sell at all. There is no reason for a firm to lower its price since it can already sell as much as it wants.
   c. If firms are making economic profits, more firms will enter the industry, an event that reduces price and makes profits disappear.
   d. If firms have economic losses, firms will exit the market, an event that will cause the price to rise.
   e. A perfectly competitive firm in long-run equilibrium is good for society because there is productive and allocative efficiency when the firm is at the lowest point on its average total cost curve and

where P = MC, the value of the last good produced equals the cost of producing that last good.

2. Assign Activity 34. There is a lot of material in this Activity, and you may want to assign it in two parts.
   a. In Part A, marginal cost is plotted at the midpoint of the output interval, and it is assumed the firm can produce any fraction of a unit of output. The profit-maximizing output at a price of $11 is seven units. ATC at seven units equals $7. This yields a short-run profit of $4 per unit and a total profit of $28 ($4 x 7).
   b. In question 2, students may have difficulty connecting market information (such as the equilibrium price of $8) with the firm or difficulty connecting changes in the firm's behavior with the market. Here it may be helpful for students to draw graphs of the market supply and demand curves and the firm's demand and cost curves. Answers in question 2d depend on whether the student correctly found a positive economic profit in question 2c. Some of the answers in question 2d may appear paradoxical since industry output increases while each firm's output decreases.
   c. The short-run market supply curve is arrived at by adding the representative firms' short-run supply curves. The long-run supply curve is not derived in the same way and is not so simple. It depends on the firm's cost curves, the existence of economic profit or loss in the short run, and the response of resource prices to changes in the number of firms (or in resource demand).
3. Discuss the answers to Activity 34.
4. Now use Visuals 3.8 and 3.9 to explain how the firm and industry reach long-run equilibrium.
   a. Visual 3.8 shows what occurs if there is an increase in the demand for Greebes.
   b. Visual 3.9 shows what occurs if there is a decrease in the demand for Greebes.
5. Now have the students complete Activity 35. This activity uses the concept of a competitive firm's marginal cost curve (above minimum AVC) as its short-run supply curve, which was developed in Activity 34; it also uses the concepts of short-run economic profits and short-run economic losses to illustrate the adjustment to long-run equilibrium where each firm is in equilibrium with zero economic profit. The case in which short-run economic profits attract additional firms was illustrated in the last part of Activity 34.
   a. This problem uses a different set of numerical data to illustrate the effect of short-run economic losses as well as short-run economic profits, and it is much more explicit in setting out the step-by-step calculations used in arriving at total economic profit.
   b. Students can get too involved in the details of an Activity like this and miss the big points. For example, ATC, which is needed to calculate profit, must be read from a graph whose scale is somewhat rough. "About $.80" and "about $1.05" are good enough. This is better than trying to fool around with "uneven" numbers such as $.79, $.81, $1.04, $1.03, etc.
   c. In obtaining the answers for questions dealing with the long-run equilibrium price, you may have to explain the steps in the chain of reasoning that lead to the correct answer.
   d. It is also very important that you emphasize that there are completely different cost and demand situations in Parts A and B of the Activity. The different conditions lead to different answers, but the adjustment process is the same.
6. Here are some other important points to stress when helping the students complete this Activity or when discussing the answers.
   a. Part A.
      1) In drawing in the market supply

schedule, the supply curve should not start until a price of $.50, which is the minimum point on each firm's AVC schedule.

2) The price of $1 received by each Greebe producer is determined by the intersection of the market demand and supply schedules. This price is also the firm's marginal revenue and average revenue.

3) The quantity produced where MR ($1) equals a marginal cost of $1 is 6,000 Greebes per week.

4) The ATC at a quantity of 6,000 is approximately $.80 (about one-fifth of the way between $.75 and $1).

5) P ($1) – ATC ($.80) gives a profit per unit of $.20 which, multiplied by 6,000 units, gives a total profit of $1,200 per week.

6) The short-run profit will attract additional firms and increase the market supply. The market supply will increase until the equilibrium price falls to the minimum point on each firm's ATC curve ($.75).

7) With P = ATC = $.75, there will be no economic profit so no additional firms will enter, and this is the long-run equilibrium price.

8) At a price (MR) of $.75, each firm will produce 5,000 Greebes per week because this is where MC = $.75.

9) At a price of $.75, the total market quantity will be 8,000,000.

$$\frac{\text{Market Quantity}}{\text{Firm Quantity}} = \frac{8{,}000{,}000}{5{,}000} = 1{,}600 \text{ firms in long-run equilibrium}$$

b. Part B.

1) The market supply schedule and the market price (MR) are obtained in the same way as in Part A, but the short-run market price is now $.75, not $1.

2) The quantity produced where MR ($.75) equals a marginal cost of $.75 is 5,000 Greebes per week.

3) The ATC at a quantity of 5,000 is approximately $1.05 (about one-fifth of the way between $1 and $1.25).

4) P ($.75) - ATC ($1.05) gives a per unit loss of $.30 which, multiplied by 5,000 units, gives a total loss of $1,500 per week.

5) The short-run loss will cause firms to leave the industry and decrease the market supply. The market supply will decline until the equilibrium price rises to the minimum point on each remaining firm's ATC curve ($1).

6) With P = ATC = $1, there will be no economic profit so no additional firms will leave, and this is the long-run equilibrium price.

7) At a price (MR) of $1, each firm will produce 6,000 Greebes per week because this is where MC = $1.

8) At a price of $1, the total market quantity will be 3,000,000.

$$\frac{\text{Market Quantity}}{\text{Firm Quantity}} = \frac{3{,}000{,}000}{6{,}000} = 500 \text{ firms in long-run equilibrium}$$

7. Now if the students are not completely exhausted, assign Activity 36 to see if they have grasped the main points of Lesson 4. They should complete the graphs.

8. Discuss the answers. For each graph, have the students give the reasons why they drew it as they did. You might have students draw the graphs on the board and then have a different student agree or disagree with the graphs as drawn and give the reasons. The "whys" are the important part of this exercise, and they are provided on the answer key.

ACTIVITY 34 **ANSWER KEY**
Costs and Competitive Market Supply (Perfect Competition)

Part A. One Firm in the Short Run

1. The Fiasco Company is a perfectly competitive firm whose daily costs of production (including a "normal" rate of profit) in the short run are as follows:

The Fiasco Company's Cost Table

Output (Per day)	Variable Cost	Total Cost	Marginal Cost	Average Total Cost	Average Variable Cost
0	0	12.00	XXXX	XXXX	XXXX
			4.00		
1	4.00	16.00		16.00	4.00
			3.00		
2	7.00	19.00		9.50	3.50
			2.00		
3	9.00	21.00		7.00	3.00
			4.00		
4	13.00	25.00		**6.25**	3.25
			6.00		
5	19.00	**31.00**		**6.20**	**3.80**
			8.00		
6	27.00	**39.00**		**6.50**	**4.50**
			10.00		
7	37.00	**49.00**		**7.00**	5.29
			12.00		
8	49.00	**61.00**		7.63	6.13
			14.00		
9	63.00	**75.00**		8.33	**7.00**
			16.00		
10	79.00	91.00		9.10	**7.90**

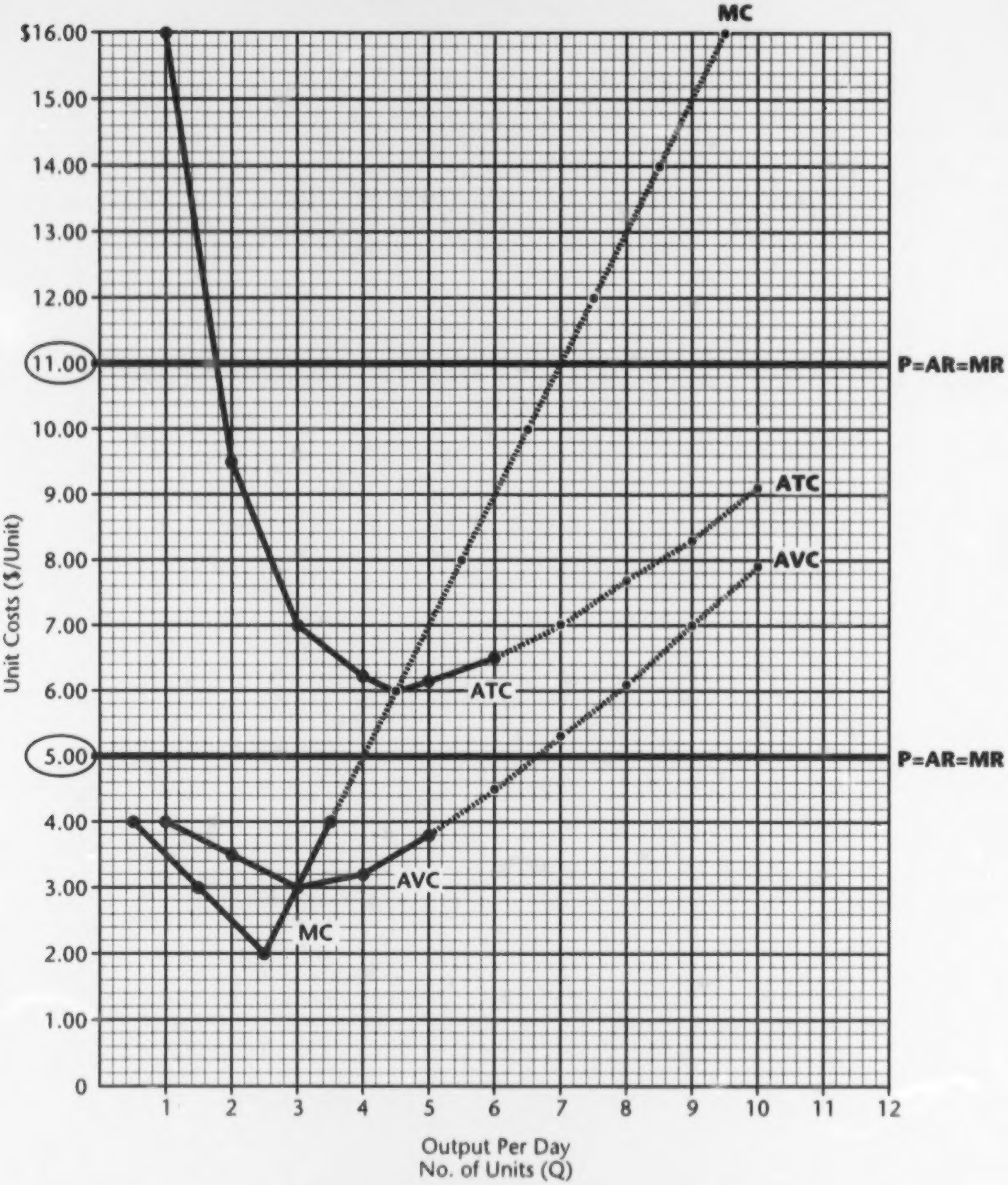
a. Fill in the blanks in *The Fiasco Company's Cost Table*. Note that marginal cost is shown between levels of output.

b. On the graph *The Fiasco Company's Cost Curve*, plot and label the average variable cost (AVC), average total cost (ATC), and marginal cost (MC) curves. Assume that this firm can produce any fraction of output per day so that you connect the points to form continuous curves. NOTE: To be absolutely precise, the marginal cost (MC) curve should be plotted midway between the output intervals. (See helpful start on the graph.)

c. How would you interpret the vertical distance between the average total cost and average variable cost curves?
It is average fixed cost (AFC). As AFC decreases continuously, the ATC and the AVC curves get closer together.

ACTIVITY 34 ANSWER KEY continued

The Flasco Company's Cost Curve



Note: Each small square = $.20 on the vertical axis and .2 units of output on the horizontal axis.
Half units of output are plotted midway between .4 units and .6 units.
Note: MC is plotted *between* output levels.

ACTIVITY 34 ANSWER KEY continued

d. Why does average total cost decline at first, then start rising as output is increased?
When MC < ATC, ATC declines.
When MC > ATC, ATC rises.
Why does MC rise? Diminishing MPP

e. The marginal cost curve intersects both average cost curves (ATC and AVC) at their minimum points. Why?
If the marginal is below the average, the average is decreasing. If the marginal is above the average, the average is increasing. Therefore, the average crosses the marginal at its lowest point.

f. If fixed costs were $20 instead of $12, how would the change affect average variable costs and marginal costs?
They would *not* change. (But ATC would increase.) Fixed cost, by definition, does not change when output changes. Therefore, fixed cost has no influence on variable cost or marginal cost.

2. Given the cost curves for Fiasco Company on the graph *The Fiasco Company's Cost Curve*, and the fact that the competitive market price at which it must sell its output is $11 a unit, fill in the blanks below and add to your graphs for Part A. (Remember, fractions of units are allowed.)

a. Draw the average and marginal revenue curves on your graph.
(a horizontal line at $11.00)

b. In order to maximize profits, Fiasco would sell **7** units, at a price of $ **11.00**. Its average total cost would be $ **7.00**. Its average revenue would be $ **11.00**. It would earn a per unit profit of $ **4.00** and total profit of $ **28.00 ($4 x 7)** per day.

c. If the firm produced instead at the quantity that minimized its average total cost, it would sell **4.5** units, at a price of $ **11.00**. Its average total cost would be $ **6.20**. Its average revenue would be $ **11.00**. It would earn a per unit profit of $ **4.80** and total profit of $ **$24 ($5 x 4.5)** per day.

d. If the competitive market price fell to $5 a unit, Fiasco would sell **4** units. Average total cost would be $ **6.25**. It would earn a per unit *(~~profit~~/loss)* of $ **1.25**, and a total *(~~profit~~/loss)* of $ **5.00 ($-1.25 x 4)** per day. (Cross out the incorrect words.)

ACTIVITY 34 ANSWER KEY continued

Part B. Many Small Firms and the Long Run

1. The long-run cost conditions (including a "normal" rate of profit) for a perfectly competitive firm are as follows:

"Normal" Rate of Profit for a Perfectly Competitive Firm

Output	Total Cost	Average Total Cost	Marginal Cost
1	9	9.00	
			4.00
2	13	6.50	
			5.00
3	18	**6.00**	
			6.00
4	24	**6.00**	
			7.00
5	31	6.20	
			8.00
6	39	**6.50**	
			9.00
7	48	6.86	
			10.00
8	58	**7.25**	
			11.00
9	69	7.67	
			12.00
10	81	8.10	

a. Fill in the blanks in the average total cost and marginal cost columns.

b. The level of output at which average total cost is at a minimum is **between 4 and 5** units. At this output average total cost is $ **6.00** .

c. What quantities would the firm be willing to supply at each of the following prices for its product? (NOTE: Strictly speaking the output decision of the firm under these conditions is ambiguous because for any of the prices two levels of output yield the same profit. For instance, if price is $7/unit, the firm earns $4 profit whether it produces 4 or 5 units. For this exercise, assume the firm chooses the larger of the two output levels.)

Price and Quantity Supplied

Price	Quantity Supplied
$ 6	4
7	**5**
8	**6**
9	**7**
10	**8**
11	**9**
12	**10**

ACTIVITY 34 ANSWER KEY continued

d. In general, the supply schedule (curve) of a perfectly competitive firm coincides with its **MC** schedule (curve) in the range where **MC** is rising and is greater than the **AVC** .

2. Suppose the perfectly competitive firm in question 1 is one of 1,000 firms currently operating in a competitive industry, all of which have identical cost functions. The market demand for this industry is given in the table.

Market Demand for an Industry

Price	Quantity Demanded	Quantity Supplied
$ 12	2,000	10,000
11	3,000	9,000
10	4,000	**8,000**
9	5,000	**7,000**
8	6,000	**6,000**
7	7,000	**5,000**
6	8,000	**4,000**

a. Fill in the industry supply schedule in the table *Market Demand for an Industry*. Then answer the following questions by filling in the answer blanks, crossing out the incorrect words in parentheses, or writing a sentence.

b. Explain briefly how the short-run supply schedule (curve) of a competitive industry is derived.
The horizontal sum at each price of all firms' supply curves = (MC above minimum AVC).

c. Given the present 1,000 firms in the industry, the present equilibrium price for the industry is $ **8.00** ; the present equilibrium quantity is **6,000** units. At this price, each firm will be making *(positive economic profit/~~zero economic profit~~/~~negative economic profit~~/~~economic losses~~)*.

d. Given the equilibrium above, and assuring that other firms can enter the industry with the same cost as the present firms, the number of firms in the industry in the long run will tend to *(increase/~~decrease~~/~~remain constant~~)* and the price will tend to *(~~increase~~/decrease/~~remain constant~~)*. The output of the industry will tend to *(increase/~~decrease~~/~~remain constant~~)*, while output per firm will *(~~increase~~/decrease/~~remain constant~~)*.

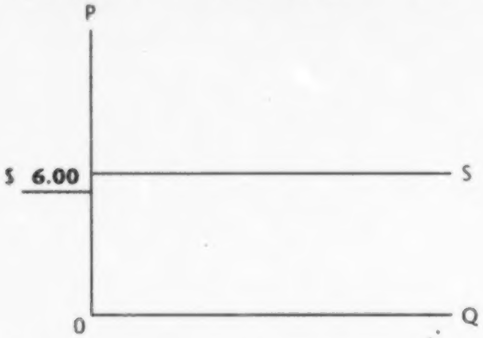
e. If this is a constant cost industry, (i.e., one where input prices don't change as the industry expands), the long-run equilibrium price for the industry will be $ **6.00** ; output per firm will be **4** units; there will be **2,000** firms in the industry each earning **0** economic profits; industry output will be **8,000** units. The equilibrium price coincides with the **minimum** per unit cost of production. **Emphasize minimum ATC.**

ACTIVITY 34 ANSWER KEY continued

f. Can you see why, under the conditions described above, that the long-run market supply curve for this industry would appear as a horizontal line on a graph? Explain.
Other firms can enter and eliminate any *economic* profit that appears. Thus, in the *long run*, all firms will be at minimum ATC.

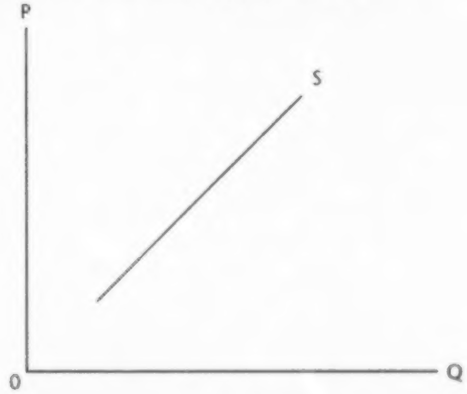
At what price would this horizontal line be plotted?

Long-Run Market Supply Curve A



g. What conditions in input markets would result in a long-run product market supply curve that slopes up to the right? Explain.
Increasing cost as new firms enter. This could be caused by most efficient resources entering first and less efficient resources entering later and/or increasing resource cost as new firms enter and have to bid up prices (cost) to draw resources away from other uses.

Long-Run Market Supply Curve B



h. Which of the *Long-Run Market Supply Curves* (*A* or *B*) do you think is likely to be the most typical case in a real world competitive market? Why?
Probably (B), but a (strained?) case could be made for (A) if one argues one or more of the following: All resources are equally efficient in all industries; replication of existing facilities does not increase cost; expanding industries can get resources from declining industries without bidding up factor cost.

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ACTIVITY 35 **ANSWER KEY**
Short-Run and Long-Run Competitive Equilibrium

Part A.
There are currently 1,000 producers of Greebes, each with economic costs like those shown in *Diagram A: Cost Situation for Each Greebe Producer*. (You should know how to label each of the cost curves.) The market demand for Greebes is shown in *Diagram B: Market Supply and Demand for Greebes*.

1. Plot on Diagram B the current market supply curve for Greebes and label this curve *S*. (Ask how much each producer will supply at various prices, and figure how much the total supply *from all 1,000 producers together* will be at those prices. NOTE: one million is a thousand thousand—1,000,000.)

Diagram A:
Cost Situation for
Each Greebe Producer

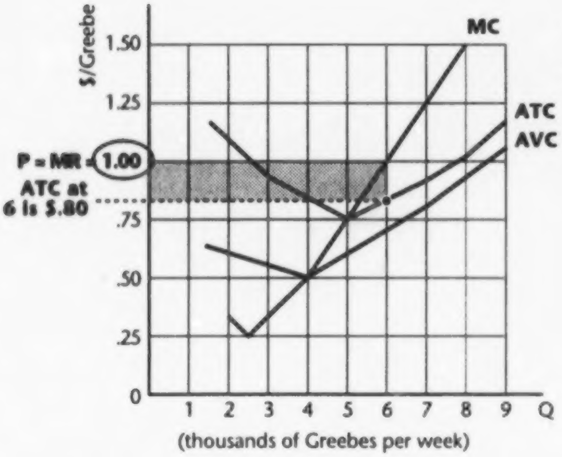
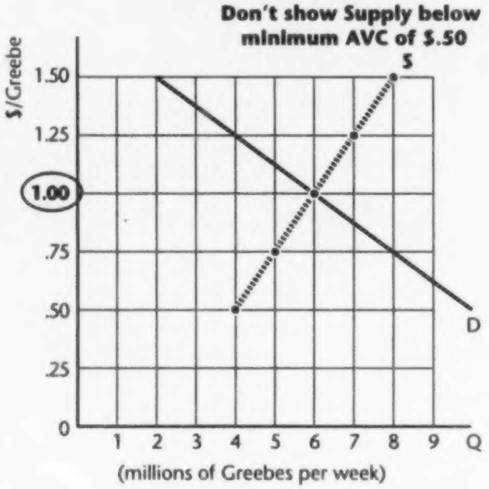


Diagram B:
Market Supply and
Demand for Greebes



2. Shade in the appropriate profit (or loss) rectangle in Diagram A, and calculate the total amount of economic profit or loss each typical Greebe producer will make under these conditions. Fill in the blanks below to aid you in your calculations.

   a. Price (P) received by each Greebe producer: $ **1.00** per Greebe

   b. Quantity (Q) produced by each Greebe producer: **6** thousand Greebes per week

   c. Average total cost (ATC) for this quantity (approximate): $ **.80** per Greebe

   d. Economic profit (loss) for each unit produced (P – ATC): $ **.20** per Greebe

   e. Total economic profit (loss) for each Greebe producer: Profit (loss) per unit x quantity produced = $ **1,200** per week. **($.20 x 6,000 = $1,200)**

ACTIVITY 35 ANSWER KEY continued

3. Is the Greebe market in long-run equilibrium? **No** Why or why not? **Short-run economic profits will attract additional firms. This will shift the market supply curve to the right, thus lowering the price.**

4. What is the long-run equilibrium price in this market? $ **.75** per Greebe
   a. How many Greebes will each firm produce at this price? **5** thousand Greebes per week.
   b. What will be the total market quantity of Greebes produced at this price? **8** million Greebes per week
   c. How many firms will be in the market at this price? **1,600 (8,000,000 ÷ 5,000 = 1,600)**

Part B.

Now, let's start all over again with a new set of cost and demand conditions in the Greebe market. There are again currently 1,000 producers of Greebes, each with *economic costs* like those shown in *Diagram C: New Cost Situation for Each Greebe Producer*. The market demand for Greebes is shown in *Diagram D: New Market Supply and Demand for Greebes*.

1. Plot on Diagram D the current market supply curve for Greebes and label this curve *S*.

Diagram C:
New Cost Situation for
Each Greebe Producer

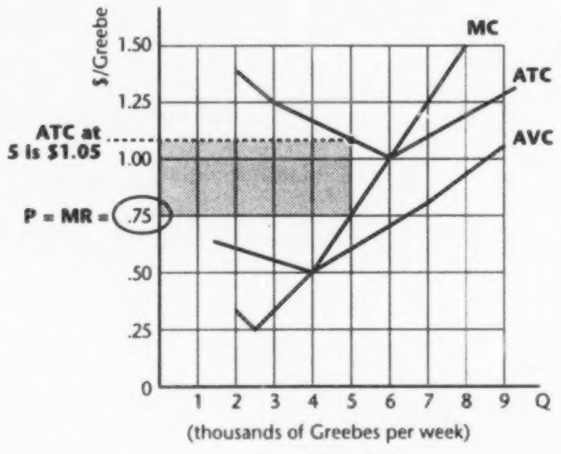
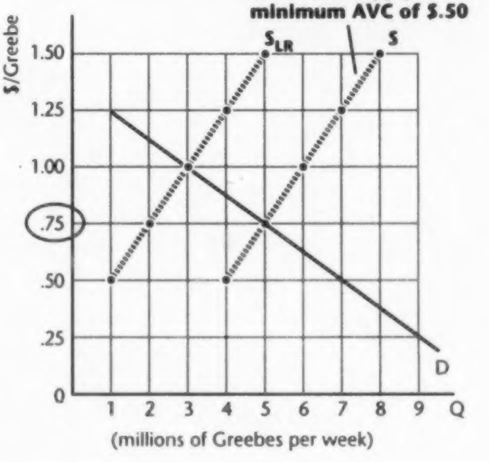


Diagram D:
New Market Supply and
Demand for Greebes

Don't show supply below minimum AVC of $.50



ACTIVITY 35 ANSWER KEY continued

2. Shade in the appropriate profit (or loss) rectangle in Diagram C, and calculate the total amount of economic profit or loss each typical Greebe producer will make under these conditions. Fill in the blanks below to aid you in your calculations.

   a. Price (P) received by each Greebe producer: $ **.75** per Greebe

   b. Quantity (Q) produced by each Greebe producer: **5** thousand Greebes per week

   c. Average total cost (ATC) for this quantity (approximate): $ **1.05** per Greebe

   d. Economic profit (loss) for each unit produced (P - ATC): $ **-.30** per Greebe

   e. Total economic profit (loss) for each Greebe producer: Profit (loss) per unit x quantity produced = $ **-1,500** per week. **(-$.30 x 5,000 = -$1,500)**

3. Is the Greebe market in long-run equilibrium? Why or why not?
   No. Short-run economic losses will cause some firms to leave the market. This will shift the market supply curve to the left, thus raising the price.

4. a. What is the long-run equilibrium price in this market? $ **1.00** per Greebe

   b. How many Greebes will each firm produce at this price? **6** thousand Greebes per week.

   c. What will be the total market quantities of Greebes produced at this price? **3** million Greebes per week

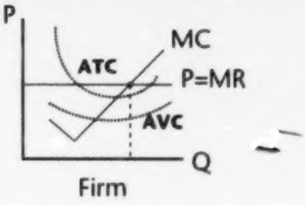
   d. How many firms will be in the market at this price? **500**
   (3,000,000 ÷ 6,000 = 500)

ACTIVITY 36 **ANSWER KEY**
Graphing Perfect Competition

The following firms or industries are all operating in a perfectly competitive market. Illustrate each situation on the graph provided. Label all curves in your answers.

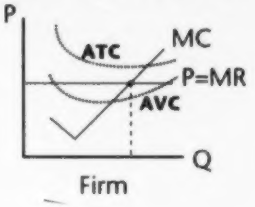
1. A firm experiencing economic profit in the short run.
   The firm will maximize profits where MR = MC and will enjoy profits because price is above its ATC curve.

Short-Run Economic Profit



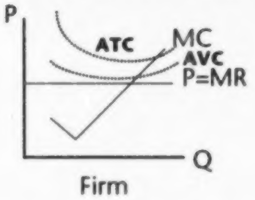
2. A firm operating with an economic loss in the short run.
   The firm will minimize losses where MR = MC. By producing where MR = MC, the firm is covering all of its variable costs and a portion of its fixed costs. In this example, the firm will minimize its losses in the short run by continuing to produce because price it above its AVC curve.

Short-Run Economic Loss



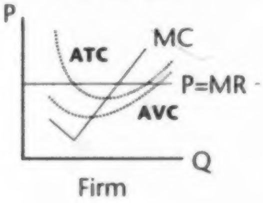
3. A firm in a classic shut-down position.
   Price is below the AVC curve, and the firm will minimize its losses by closing down. However, it will still experience fixed cost.

Classic Shut-Down Position

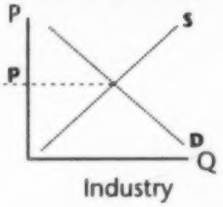


4. Short-run equilibrium for a firm and industry. Assume the firm is making an economic profit. **The firm is making its maximum profit where MC = MR. This is only short-run equilibrium because the profit will attract other firms to the market.**

Short-Run Equilibrium for a Firm



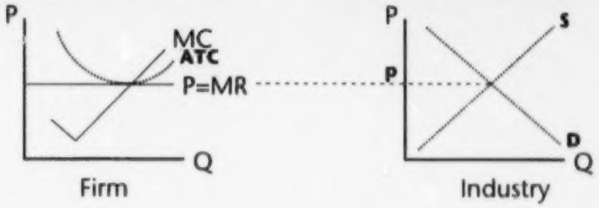
Short-Run Equilibrium for an Industry



ACTIVITY 36 ANSWER KEY continued

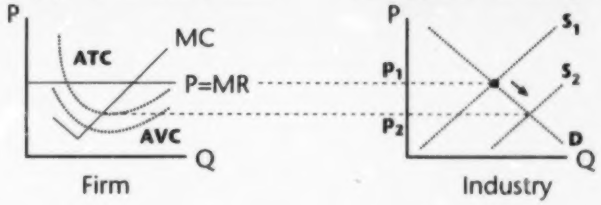
5. Long-run equilibrium for a firm and industry.
The firm will be in long-run equilibrium where MC = minimum ATC = MR. The firm is breaking even; there is no incentive for other firms to enter the market.

Long-Run Equilibrium for a Firm **Long-Run Equilibrium for an Industry**



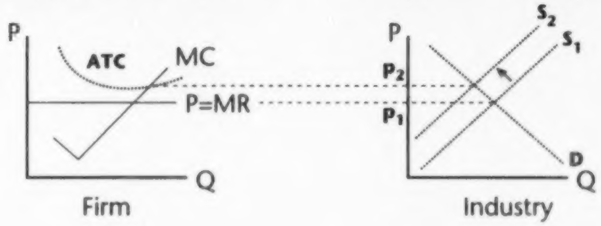
6. Illustrate how economic profits will disappear in the long run.
Reports of firms making an economic profit will cause other firms to enter the market. This will shift the supply curve to the right, causing prices to drop and eliminating profits. The firm will then be in long-run equilibrium at the break-even point.

How Economic Profits for a Firm will Disappear in Long Run **How Economic Profits for an Industry will Disappear in Long Run**



7. Illustrate how economic losses will disappear in the long run.
Firms within an industry cannot continue to operate at a loss in the long run. Therefore, those least efficient will exit the industry first, thus shifting the industry supply curve to the left and raising price. Firms that survive will move to their break-even long-run equilibrium.

How Economic Losses for a Firm will Disappear in Long Run **How Economic Losses for an Industry will Disappear in Long Run**



UNIT 3, LESSON 5

The Monopoly Firm

Introduction and Description:
In Lessons 3 and 4, students learned why perfect competition leads to an optimum allocation of resources in the long run. They found that even though the perfect competitor's goal was to maximize profits, in the long run the perfect competitor made no economic profits—only normal profits. The perfect competitor also is productively (technically) and allocatively efficient. All rejoice when the perfectly competitive firm seeks to maximize profits.

When a monopolist attempts to maximize profits, it results in a misallocation of resources. In long-run equilibrium, the monopoly may make an economic profit and is not allocatively or productively efficient. All (except the monopolist) can complain when a monopoly attempts to maximize profits.

Activity 37 is a key to understanding monopoly behavior. The cost concepts for all types of market structure are conceptually the same. But a monopolist is a price seeker (price maker). The monopolist's demand curve is downsloping, and marginal revenue is less than price. Therefore, marginal revenue and price are different for a monopoly.

Activity 38 illustrates long-run equilibrium for a monopolist. Students should see that a monopoly will charge a higher price, produce less, and be less productively and allocatively efficient than a perfect competitor.

Exercise 39 reinforces how monopolies determine price and output and how this affects society.

Objectives

1. Define *marginal revenue*.
2. Calculate marginal revenue from a schedule of output and total revenue, and plot marginal revenue and price.
3. Explain why the marginal revenue curve lies below the demand curve when plotted on a graph.
4. Explain why a monopoly firm should never operate on the inelastic portion of its demand curve.
5. Given cost and demand information, find the monopolist's profit-maximizing output.
6. Calculate the monopoly firm's profit or loss at its profit-maximizing output.
7. Compare and contrast the monopolist's profit-maximizing price, output, and profit with those of a perfect competitor.

Time Required

- Two class periods

Materials

1. Activities 37, 38, and 39
2. Visuals 3.10 and 3.11

Procedure

1. Use Visual 3.10 to explain that a monopolist is a price seeker (price searcher). The monopolist can charge any price it wants, but it cannot repeal the law of demand. If the monopolist raises its price, it will sell less. If it lowers its price, it will sell more.
2. Now use Visual 3.10 to explain why marginal revenue for the monopolist is less than price. This is because if the monopolist lowers the price in order to sell more Greebes, it must lower the price on all the Greebes it sells. Price cuts will apply not only to the extra output sold but to all other Greebes that could have been sold at a higher price.
3. Assign Activity 37. Here are some things to watch out for as the students complete the activity. In plotting the curves, students have to add "points" or "dots": four on the demand curve and three on the marginal revenue curve. Students sometimes incorrectly connect the dots on the demand curve with the dots on the marginal revenue curve. Make sure they connect the points on the two curves correctly.
4. Discuss Activity 37. Here are some points to make in the discussion.

LESSON 5 continued

a. Begin with a schedule of output and total revenue or, equivalently, a demand schedule since price (P) x quantity demanded (Q) = TR.

b. Calculate the change in total revenue (ΔTR) over each quantity interval.

c. Calculate the change in the number of units of output over each quantity interval (ΔQ).

d. Marginal revenue equals the change in total revenue divided by the change in quantity. $MR = \frac{\Delta TR}{\Delta Q}$.

Changes in TR = MR if $\Delta Q = 1$.

e. Plot the MR just calculated at the midpoint of the quantity interval. For example, over the quantity interval from 300 to 400 units, total revenue increases from $2,700 to $3,000. The change in TR is ($3,000 – $2,700) = $300. The change in quantity (Q) is (400 – 300) = 100. Then marginal revenue is $\frac{\$300}{\$100} = \$3$.

The midpoint of the quantity interval from 300 to 400 is 350, and the marginal revenue figure of $3 is plotted at quantity level 350 units.

f. As explained in the third paragraph of Activity 37, if a monopolist sees a downward sloping demand curve, and if the monopolist has to charge everyone the same price, it must lower the price to increase the quantity sold. The marginal revenue on an additional unit at the lower price can never equal the old (higher) price so the marginal revenue curve will always lie below the demand curve.

g. As indicated on the answer key, a monopolist will never operate on the inelastic portion of the demand curve. Reducing output in the inelastic region will increase total revenue and reduce total cost at the same time. Since increasing revenue and reducing cost are bound to increase profit, a monopolist will never operate in the area where demand is inelastic (MR < 0). It will try to keep reducing output until the demand curve becomes elastic (MR > 0). Or, put another way, since MC is always greater than 0, the MC = MR profit-maximizing rule requires that MR > 0, and this means that demand is elastic since total revenue increases with an increase in output.

5. Now use Visual 3.11 to explain the monopolist's profit-maximizing price and output. The monopolist will produce 500 Greebes because it maximizes profits where MR = MC. It is a good idea to ask why a monopoly maximizes profits where MR = MC. The price will be $122. This yields a profit of $28 per Greebe or $14,000 total profit.

6. Use Visual 3.11 to compare the output of the monopolist with that of the perfect competitor. A perfect competitor would operate where P = MC = ATC. This is at the bottom of the ATC curve or at an output of 700 Greebes. The price would be about $100. Compared to the perfect competitor, the monopolist operates at: a) a higher price, b) a lower output, and c) where P > MC or an allocatively inefficient output.

7. Have the students complete Activity 38.

8. Discuss the answers and pay attention to these points.

   a. The profit-maximizing monopolist finds the output where MC = MR. In the MC and MR columns on the first page of the Activity, they are equal only at an output of four units where MC = MR = $300.

   b. To calculate the monopolist's profit or loss, the profit-maximizing output must be determined first. Then at four units, the table gives the value for price and average cost:

   Profit per unit = (Price – ATC)
   = ($750 – $600) = $150

   Total profit = (P – ATC)•(Q)
   = ($150)•(4) = $600

   c. Finally, compare the equilibrium of the monopolist with that of a perfect competitor. The perfect competitor would produce five units at a price of $600. The perfect competitor would produce more at a lower price.

9. Assign Activity 39 to reinforce these concepts.

10. Discuss Activity 39.

ACTIVITY 37 **ANSWER KEY**
Marginal Revenue for an Imperfect Competitor

Marginal revenue is the rate at which *additional* revenue is obtained from selling *additional* output (ΔR/ΔQ). If selling an additional 100 units of output adds $1,200 to total revenue, the marginal revenue per unit is $1,200/100 = $12.00.

For a perfectly competitive firm (too small to affect the market price) marginal revenue and price (or average revenue) are the same thing. A competitive firm can sell as much or as little output as it desires at the market price on a take-it-or-leave-it basis, but it is too small to have any influence on the price itself. A competitive firm is a "price taker."

For a firm that is big enough to see the whole market demand curve (rather than just the going market price), and/or big enough to influence the market price, however, marginal revenue and price are *not* the same thing. If a monopolist can see a downward sloping demand curve, it means that the price must be lowered if the monopolist wants to sell more output. Assuming the monopolist charges all customers the same price, marginal revenue will be *less* than price (or average revenue) at any given level of output. A monopolist is thus a "price searcher," who must seek to find the levels of price, output, and marginal revenue that will maximize profits.

Assume that a monopolist faces the demand curve indicated in the table *Average Revenue and Marginal Revenue for a Monopoly*.

Fill in the blanks in the table and plot both the demand curve and the marginal revenue curve on the axes provided on the graph *Plotting Average Revenue and Marginal Revenue for a Monopoly*. Label the demand curve *D* and the marginal revenue curve *MR*. (NOTE that the marginal revenue data are to be plotted midway between the quantity levels shown in the second column of the table, i.e., at the quantity levels given in the last column of the table.)

For a firm big enough to see the whole demand curve, marginal revenue is positive (greater than zero) when the demand curve is elastic, but marginal revenue is negative (less than zero) when the demand curve is inelastic.

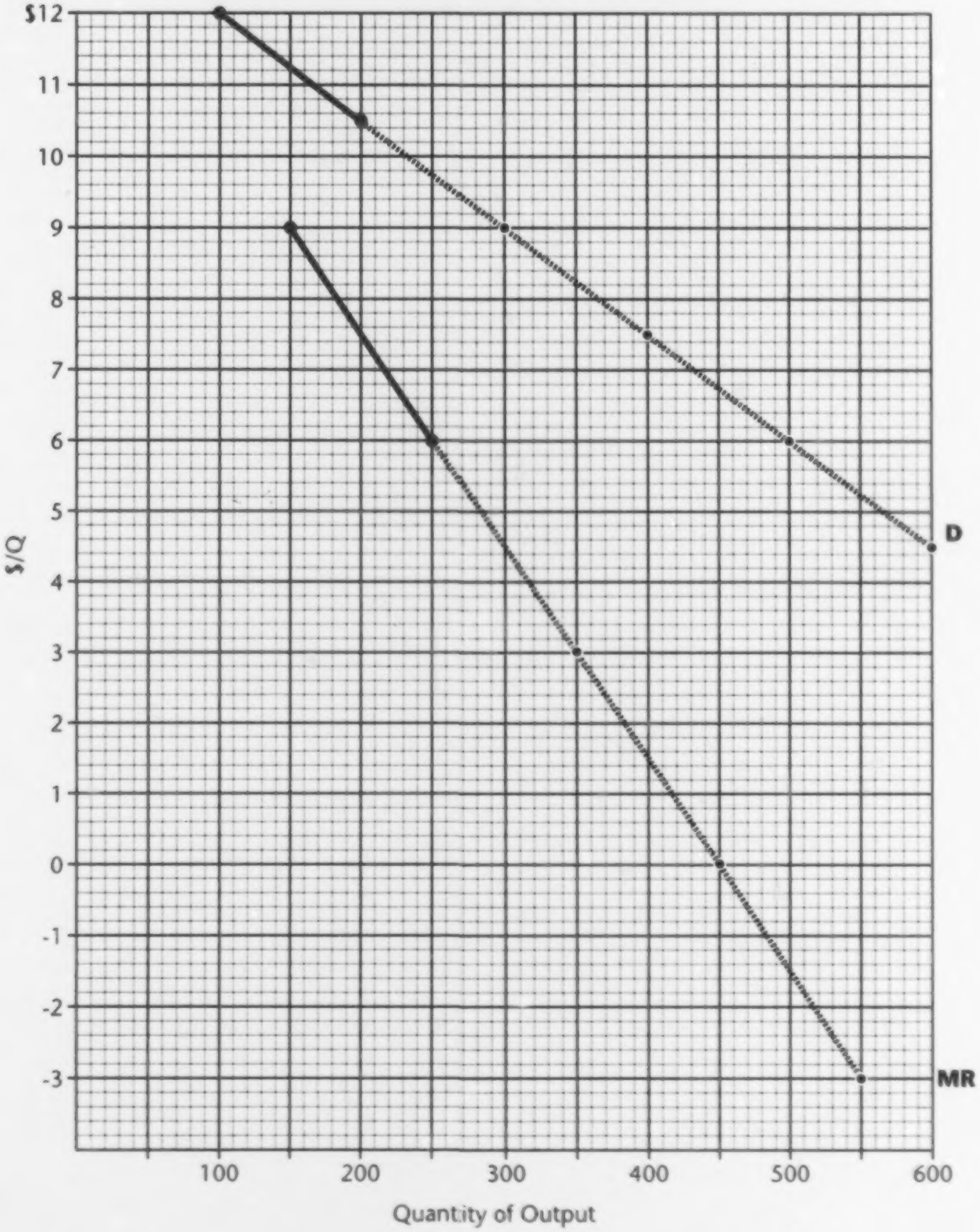
Will a monopoly firm ever operate on the inelastic portion of its demand curve? **No**
Why or why not? **As long as demand is *in*elastic, marginal revenue is negative and a reduction in output will increase total revenue and reduce total cost at the same time.**

Average Revenue and Marginal Revenue for a Monopoly

Price (Average Revenue)	Quantity Demanded (Q)	Total Revenue (R)	Change in Total Revenue (ΔR)	Marginal Revenue (ΔR/ΔQ)	Plot at Quantity of
$12.00	100	$1,200			
			$900	$9.00	150
10.50	200	2,100			
			600	**6.00**	250
9.00	300	2,700			
			300	**3.00**	350
7.50	400	**3,000**			
			0	0	450
6.00	500	3,000			
			-300	-300	550
4.50	600	2,700			

ACTIVITY 37 ANSWER KEY continued

Plotting Average Revenue and Marginal Revenue for a Monopoly



Note: Each small square = $.20 on the vertiical axis and 10 units of output on the horizontal axis.

ACTIVITY 38 **ANSWER KEY**
Pure Monopoly

Like other producers in a market economy, a pure monopolist tries to maximize profit by producing at an output where marginal cost (MC) equals marginal revenue (MR). For a firm in a competitive market, price and marginal revenue are the same, but for a monopolist, who "sees" the entire market demand curve and who must charge all buyers the same price, marginal revenue is below price. This activity considers the choice of output level by a monopolist.

Part A.

1. The table *Pure Monopoly: Cost and Revenue Data* presents a summary of the relevant cost and revenue data facing a pure monopoly firm. Fill in the blanks in the table.

2. Complete the job of plotting the data for MC, MR, ATC (average total cost), and AR (average revenue) in the graph *Profit-Maximizing Equilibrium for a Monopoly*. Since in this problem output cannot increase by a fraction of a unit, the plotted data should connect the points at the output intervals shown in the table.

Pure Monopoly: Cost and Revenue Data

Quantity of Output	Total Cost	Marginal Cost	Average Total Cost	Total Revenue	Marginal Revenue	Average Revenue (Price)
0	$0		$0	$0		$0
		$900			$1,200	
1	900		900	1,200		1,200
		700			900	
2	1,600		800	2,100		1,050
		500			**600**	
3	2,100		700	2,700		900
		300			300	
4	2,400		**600**	3,000		**750**
		600			**0**	
5	3,000		**600**	3,000		**600**
		1,200			-300	
6	4,200		**700**	2,700		**450**

Part B.

After you have completed the table and the graph, answer the questions in Part B by filling in the blanks and shading in the area indicated in question 5. In order to make the mathematics easier, plot marginal revenue and marginal cost at the whole numbers, not between the numbers.

1. A profit-maximizing monopolist would produce an output of **4** units.

2. At this level of output, MC is $ **300** per unit and MR is $ **300** per unit.

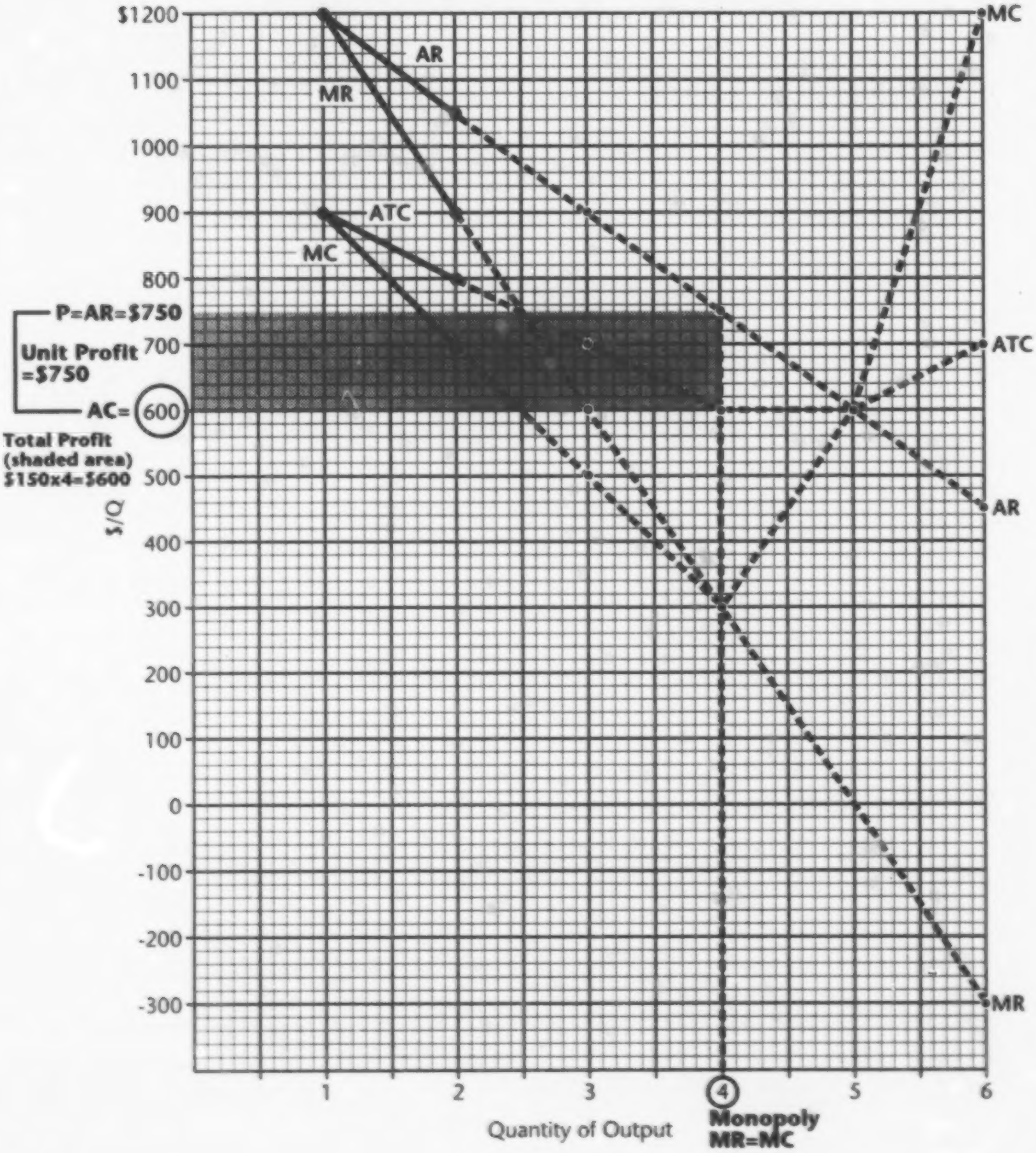
3. At this level of output, the AC is $ **600** per unit and the AR (price) is $ **750** per unit.

4. This gives the monopolist an economic profit of $ **150** per unit for a total economic profit of $ **600** **($150 x 4 = $600)**

ACTIVITY 38 ANSWER KEY continued

5. Shade in the area on the graph that represents the total economic profit figure indicated in your answer to question 4.

Profit-Maximizing Equilibrium for a Monopoly



Note: Each small square = $20 on the vertical axis and 1/10 unit of output on the horizontal axis.

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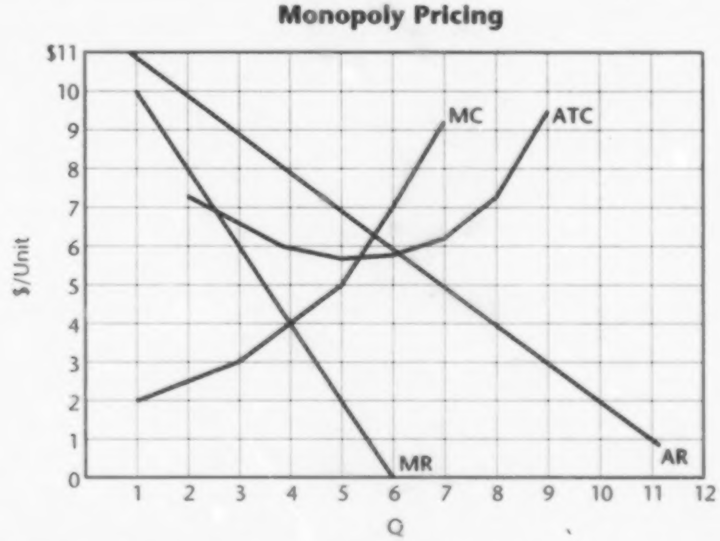
ACTIVITY 39 **ANSWER KEY**
Monopoly Pricing



Use the graph *Monopoly Pricing* to answer these questions.

1. What is the maximum profit output? **4 (MR = MC)**
2. What is the price at that output? **$8 (Did they go up to the demand curve?)**
3. What is revenue per unit at that output? **$8 (Same as price.)**
4. What is cost per unit at that output? **$6 (Did they go to the average cost curve?)**
5. What is total revenue at that output? **$32 ($8 x 4)**
6. What is total cost at that output? **$24 ($6 x 4)**
7. What is profit or loss per unit at that output? **$2 ($8 – $6)**
8. What is total profit or loss at that output? **$8 ($2 x 4. You might want to shade in the total profit area to illustrate this.)**
9. At what output and price combination would this firm break even? **$5.75 and 6 units (This is where a perfect competitor would operate in the long run.)**
10. If this were a perfectly competitive industry (other than the fact that demand would be perfectly elastic), excess profits would exist and new firms would enter the industry. Since this is a monopoly situation and new firms cannot enter the industry, what will happen to these excess profits? **The monopolist will keep them. (This is an opportunity to compare perfect competition and monopoly again.)**

11. Based on your answer to question 10, if this monopoly were a government-regulated monopoly and *you* were the government, what restrictions, regulations, or requirements would you place on this company? **You would force them to lower their price and increase their output. Some people would advocate that they go where *P* = *MC* (perfect allocation point), while others would argue they should go where *P* = *ATC* (break-even point).**

UNIT 3, LESSON 6

Regulating Monopoly: Antitrust Policy in the Real World

Introduction and Description

Because a monopoly produces an inefficient level of output, government often tries to regulate monopoly or break up a monopoly into several firms.

Without using graphs, Activity 40 illustrates why unregulated monopolies have undesirable outcomes. Students must go beyond graphs to really understand the behavior of monopolies. In discussing this Activity, you might also insert some current case studies on monopoly. We have not included these in order to keep the workbook from becoming dated.

Activity 41 shows how government regulates natural monopolies. Be sure that the students can differentiate among the unregulated price, the fair return price (P = ATC), and the socially optimal price (P = MC).

Activity 42 is a brain teaser. If students can answer these problems, they really understand the interrelationship between revenues and costs for a monopoly firm. Activity 42 would be a good group activity.

Finally, Activity 43 compares monopoly and perfect competition. It is a review exercise designed to bring closure to the topics of monopoly and perfect competition.

Objectives

1. Analyze the effects of pure monopoly on the price of the product, the quantity of the product produced, and the allocation of society's resources.
2. Identify the socially optimal and fair return price for a regulated monopoly.
3. Identify the characteristics of a natural monopoly and discuss why natural monopolies occur.
4. Describe price discrimination and analyze its effects on society.
5. Given data, recommend the proper price and output for a monopoly.
6. Compare and contrast the effects of perfect competition and monopoly on society.

Time Required

- Two class periods

Materials

Activities 40, 41, 42, and 43

Procedure

1. Assign Activity 40 and have the students answer the questions that follow the article.
2. Discuss the questions in Activity 40. Many of these examples are not pure monopolies, but the monopoly model is useful in analyzing the effects of these cases. Be sure to bring out the reasons that monopolies harm society. Also be sure to pay particular attention to price discrimination and its effects.
3. Give a lecture discussing:
    a. Why natural monopolies occur.
    b. The advantages and disadvantages of regulating monopolies at the fair return price.
    c. The advantages and disadvantages of regulating monopolies at the socially optimal price.
4. Assign Activity 41 and discuss the answers.
5. Assign Activity 42 as a group activity or as homework.
6. Go over the answers to Activity 42. On the answer key grid only information necessary for the solution of the problem has been displayed. A visual can be made from the answer grid to facilitate the discussion. Here is the logic used to come to the correct answers.

Case #1: a) MC = MR; therefore, the firm is in the best possible position.

b) To determine TC, multiply ATC by Q.

c) TC - FC = VC = $13,000.

d) TR = P x Q = $12,500.

e) Revenue does not cover VC; therefore, this firm should shut down. Answer: 3.

Case # 2: a) Find ATC by TC ÷ Q.

b) When ATC is at its minimum, it equals MC; therefore, MC = $4.

c) MR = MC; therefore, the firm is in the best possible position.

d) The firm is in the correct position. Answer: 2.

Case #3: a) MR may not exceed P; therefore, this case is nonsense. Answer: 1.

Case #4: a) MR = MC; therefore, the firm is in the best possible position.

b) Check to see if the firm is covering VC; it is since P is above ATC.

c) Therefore, the firm is in the correct position. Answer: 2.

Case #5: a) Find P by TR ÷ Q.

b) Since you know MR is less than P, it follows that MC, which is equal to P, is greater than MR.

c) Therefore, the firm should reduce production and increase price. Answer: 4.

Case #6: a) MR is greater than MC.

b) Therefore, increase production and decrease P. Answer: 5.

Case #7: a) Fixed costs are fixed; they don't decline. Therefore, this case is nonsense. Answer: 1.

7. Assign Activity 43 and go over the answers.

8. Conclude by summarizing the differences in price, output, and efficiency between a perfectly competitive firm and a monopoly firm. .

ACTIVITY 40 **ANSWER KEY**

Let's Play Monopoly

1. Do you agree or disagree with the final contestants for the monopoly award? Explain. **Answers will vary but should include discussion on the runners up as well as the contestants that were selected. Include the characteristics of a monopoly and how the selected contestants fit that description.**

2. How might the fax machine change the market for first-class mail?
The fax machine has created competition for first-class mail service by offering consumers a faster and fairly inexpensive alternative.

3. What prevents a cartel, particularly OPEC, from maintaining a long-run monopoly? What would help to make it more successful?
Because of the voluntary participation of members, cartels may have a very difficult time convincing all members of the benefits of playing by the rules. Particularly with OPEC, the economic incentives to members to undercut the cartel's pricing system are too great. To prevent that, there must be greater restrictions on members and better enforcement of the rules.

4. How do the cable companies represent the normal arguments against monopolies?
Cable companies are traditionally known for poor service and high prices. Have students explain this graphically to reinforce the concept of economic inefficiency with monopolies.

5. What is price discrimination and under what conditions is it successful?
Price discrimination is selling the same service for different prices. It is effective when offering a service that cannot be resold. For example, hotel rooms, airline fares, and college scholarships are all examples of price discrimination. This is a good place to discuss price discrimination. It increases a monopoly's output and profits. Ironically, it also makes the monopoly more allocatively efficient.

6. Why doesn't the NCAA have competition in providing a forum for young athletes to play sports?
Discuss reasons that other leagues have not formed and the barriers there are to their formation. Include costs and indicate which groups would benefit and which groups would be harmed.

7. If athletes know that only a small percentage will be able to make the NBA, why do they bother playing college basketball?
They have the prestige that goes with playing on a college team and the opportunity for an education, and most important, they may be one of those chosen few.

8. Why are monopolies considered to be bad? Be sure to discuss price, output, and efficiency in your answer.
A monopoly produces a lower output and charges a higher price than a perfect competitor. It also is allocatively and productively less efficient than a perfect competitor.

ACTIVITY 41 **ANSWER KEY**
Regulating Monopoly

All figures in question 1 are approximations.

1. If this monopolist is not regulated, what will be the level of:

    a. output? **About 1,500 units**

    b. price? **$4.00**

    c. total revenue? **$4.00 x 1,500 = $6,000**

    d. total costs? **$3.30 x 1,500 = $4,950**

    e. profit or loss? **$6,000 – $4,950 = $1,050 (profit)**

2. If this monopolist is regulated by marginal cost pricing (i.e., the socially optimal price), what will be the level of:

    a. output? **3,000**

    b. price? **$1.50**

    c. total revenue? **$1.50 x 3,000 = $4,500**

    d. total costs? **$2.50 x 3,000 = $7,500**

    e. profit or loss? **$4,500 – $7,500 = –$3,000 (loss)**

    f. Will the monopoly need a subsidy? **You bet.**

    g. If so, how much? **$3,000**

3. If cost-of-service regulation (fair-return price) is imposed on this monopolist, what will be the level of:

    a. output? **2,000**

    b. price? **$3.00**

    c. total revenue? **$3.00 x 2,000 = $6,000**

    d. total costs? **$3.00 x 2,000 = $6,000**

    e. profit or loss? **0**

ACTIVITY 42 **ANSWER KEY**
Monopoly Consultants, Inc.

You have been retained by seven corporations to advise them on their future output and price decisions. These firms are listed on the chart *Monopoly Consultants, Inc. Monopoly Model*. Each firm is a pure monopoly and desires to maximize its profits or minimize its losses. Before making your recommendations, fill in as much of the incomplete data in the chart as possible. Although you may not be able to fill in every box, there are sufficient data in each case to recommend action that is in the best interest of the firm.

After you have analyzed each case, decide which statement below is the best course of action for the firm involved. Place the number of the statement in the answer column.

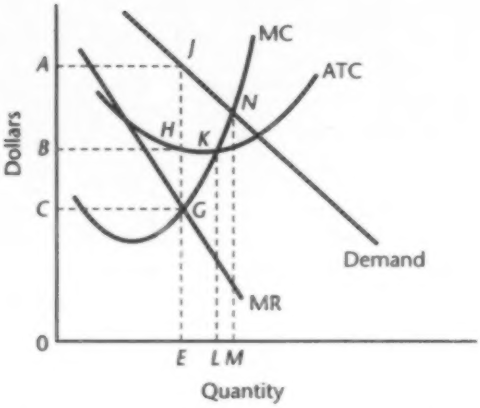
1. Nonsense—the information is inconsistent and could not be correct.
2. This firm is in the correct position.
3. This firm should shut down because its revenue does not exceed variable cost.
4. This firm should reduce production and increase price.
5. This firm should increase production and reduce price.

Monopoly Consultants, Inc. Monopoly Model

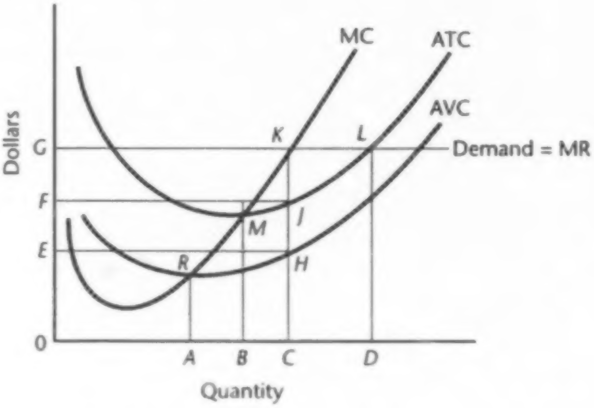
Case	Price	Marginal Revenue	Quantity Output	Total Revenue	Total Cost	Fixed Cost	Average Cost	Marginal Cost	Answer
1	$1.25	$1.00	10,000	**$12,500**	**$15,000**	$2,000	$1.50	$1.00	**3**
2	$5.00	$4.00	1,000		$4,000		**$4.00** Minimum Level	**$4.00**	**2**
3	$1.50	$2.00	10,000				$2.00	$2.00	**1**
4	Above Marginal Revenue	$5.00					$5.00	$5.00	**2**
5	**$2.00**		4,000	8,000	$7,200			$2.00	**4**
6	$7.00	$4.00	2,000		$8,000			$3.00	**5**
7			5,000	9,000	$10,000	Declining	Minimum Level		**1**

ACTIVITY 43 **ANSWER KEY**
A Quick Review of Perfect Competition and Monopoly

Monopoly Graph



Perfect Competition Graph



These questions are based on the graphs above. Circle the letter of each correct answer.

1. A monopoly firm will maximize profits at what price?
   [✓ a. OA] b. OB c. OC d. OG
2. Economic profits for the monopoly firm are represented by the area of which rectangle?
   a. OCGE b. OAJE [✓ c. AJHB] d. BAJN
3. Total costs for the monopoly firm are represented by the area of which rectangle?
   a. BKLO b. CGEO c. AJEO [✓ d. BHEO]
4. The total revenue for the monopoly firm is represented by the area of which rectangle?
   a. OCGE [✓ b. OAJE] c. AJHB d. BAJN
5. The perfect competitor will maximize profits at what price?
   a. OE b. OF [✓ c. OG] d. OA
6. The perfect competitor will shut down below which price-output relationship?
   a. K b. M c. L [✓ d. R]
7. At price OG, the area of which rectangle represents total revenue for the perfect competitor at profit-maximizing output?
   [✓ a. OGKC] b. OFJC c. FGHJ d. FFJH
8. At output OC, total variable cost is represented by the area of which rectangle?
   a. OGKC b. FGKJ [✓ c. OEHC] d. OFJC
9. At price OG, profits for the perfect competitor are represented by the area of which rectangle?
   a. OGKC b. OFNB [✓ c. FGKJ] d. OEHC
10. At what price-output relationship will a perfect competitor operate in the long run?
   a. K b. L [✓ c. M] d. R

UNIT 3, LESSON 7

Monopolistic Competition and Oligopoly

Introduction and Description

Perfect competition and monopoly give us some of the basic tools needed to understand how product price and output are determined. Although they simplify reality, perfect competition and monopoly identify conditions that affect consumers' and producers' behavior. Perfect competition and monopoly, however, are the exception in the U.S. economy. Most market structures are between these two extremes, and they are the focus of this lesson.

Today the U.S. economy is dominated by oligopolies and monopolistically competitive firms. An oligopolistic industry is dominated by a few large firms that act interdependently in output and pricing decisions. Monopolistic competition is a market in which a relatively large number of firms of small and moderate size offers similar but not identical products. Most retailing in the United States is conducted under conditions of monopolistic competition. In contrast, manufacturing typically occurs under conditions of oligopoly.

Objectives

1. Define and discuss the nature of *monopolistic competition*.
2. When given cost and price data, determine the output and price charged by a monopolistic competitor in the short run and in the long run.
3. Identify the wastes of monopolistic competition and explain why product differentiation may offset these wastes.
4. Define and discuss the nature of *oligopoly*.
5. When given cost and price data, determine the output and price charged by an oligopolist in the short run and in the long run.
6. Discuss the role of nonprice competition in oligopoly.
7. Describe the types of nonprice competition used by oligopolists.
8. Discuss the mutual interdependence of oligopolists and analyze how this provides incentives to cheat on a collusive agreement.

Time Required

- Three class periods

Materials

1. Activities 44, 45, 46, and 47
2. Visuals 3.12 and 3.13

Procedure

1. Use Visual 3.12 to describe the characteristics of monopolistic competition.
   a. Give specific examples of monopolistic competition.
   b. Explain why the demand curve of a monopolistic competitor is downsloping but not as steep as that of a monopolist.
   c. Explain that monopolistic competition is very similar to perfect competition except for a differentiated product.
   d. Explain why a monopolistic competitor can have profits and losses in the short run.
   e. Explain why a monopolistic competitor breaks even in the long run but does not operate at the most efficient point either allocatively or productively.
2. Have the students complete Activity 44 and discuss the answers.
3. Introduce Activity 45.
   a. Have the students examine the *Easy Entry in the Video Biz* graph on the first page of Activity 45, and ask why videotape rentals might be considered perfect competition.
   b. Have the students examine the monopolistically competitive graph *Videotape*

LESSON 7 continued

Rentals, and ask why videotape rentals also might be considered monopolistic competition.

c. Ask the students what kind of competitors videotape rental stores really are. (The answer is probably monopolistic competition. Even though a videotape is a videotape, stores differ in the number of videos, ambiance, and quality of service.)

4. Have the students complete Activity 45 and discuss the answers.

5. Use Visual 3.13 to discuss the characteristics of oligopoly.

    a. Give specific examples of oligopoly.

    b. Distinguish between homogeneous and differentiated oligopoly.

    c. Emphasize that a kinked demand curve is a model describing the behavior of a noncollusive oligopoly.

6. Show the students that in the oligopoly market the demand curve for the firm and the demand curve for the market determine the demand curve for the individual seller. This results in a kinked demand curve.

7. Illustrate this point by asking the following questions.

    a. What would happen if the oligopolist raised its price above the kink? (The oligopolist would lose quantity demanded, causing revenue to fall.)

    b. Would other firms in the oligopoly raise their price in response to the increase in price? (No, because they do not wish to lose market share.)

    c. What would happen if the oligopolist lowered its price below the kink? (The lowered price would not be profitable because the demand curve below the kink is inelastic. If the oligopolist lowered its price, the percentage change in quantity demanded would be less than the percentage change in price. Other firms would follow a price decrease. You may also wish to bring in the concept of price wars.)

8. Show the students how to derive the MR curve for the oligopolist. Explain how the break in the MR curve allows for profit maximization with a number of MC curves.

9. Explain that the kinked demand curve is a model designed to show that oligopolists prefer nonprice competition to price competition.

10. Discuss the relevance of the kinked demand model. Students should be able to come up with examples of oligopolists in price wars. A kinked demand curve has shortcomings and is not as accepted as other models of market structure.

11. Discuss types of collusion as a way for oligopolists to deal with their pricing dilemma:

    a) overt collusion,

    b) price leadership, and

    c) cost-plus pricing.

12. Have the students answer the questions in Activity 46 and discuss the answers.

13. Have the students read Activity 47 and answer the questions.

14. In discussing the answers, emphasize that the real world is a lot messier than our models. However, we can conclude that most forms of competition are between perfect competition and monopoly and exhibit characteristics of each model.

ACTIVITY 44 **ANSWER KEY**
Monopolistic Competition

1. a. At what level of output will this firm operate? **L**
   b. What is marginal revenue at this level of output? **A**
   c. What price will this firm charge for its product? **E**
   d. The area of which rectangle is equal to total revenue? **OEFL**
   e. What is the firm's average total cost? **C**
   f. The area of which rectangle is equal to the firm's total cost? **OCHL**
   g. Is the firm making profits or incurring losses? **Making economic profits**
   h. The area of which rectangle is equal to profits or losses? **CEFH**

2. Would the demand curve for a monopolistic competitor be more or less elastic than the demand curve for a monopolist? Justify your answer.
   More elastic. Because there are many producers, the monopolistic competitor will lose sales to those producers if it raises prices.

3. What are the characteristics of a monopolistically competitive market? In what sense is there competition, and in what sense is there monopoly in this type of market structure?
   Monopolistic competition is characterized by many firms selling a differentiated but similar product. It is similar to monopoly because the firm has some control over price. It is similar to perfect competition because there are few barriers to entry, many competitors, and long-run profits may exist but probably will be low.

4. Is monopolistic competition closer to monopoly or to perfect competition?
   Perfect competition.

5. What are three examples of monopolistically competitive markets?
   Almost all retailing is done under conditions of monopolistic competition.

6. True, false, or uncertain, and why? "Monopolistic competition is just another form of pure monopoly."
   ***False.* It has many of the characteristics of perfect competition.**

7. True, false, or uncertain, and why? "Monopolistic competition is even better than perfect competition."
   ***Uncertain.* Monopolistic competition does allow price and quality competition. Consumers have a wider choice under monopolistic competition. However, price is higher and output lower than under perfect competition. Monopolistic competition also creates excess capacity.**

8. True, false, or uncertain, and why? "In the long run, monopolistic competitors produce at their most efficient point."
   ***False.* Monopolistic competitors do not operate at the bottom of their average cost curve (productive efficiency) or where P = MC (allocative efficiency).**

ACTIVITY 45 **ANSWER KEY**
Supply, Demand, and Videotape

Part A.

1. Is the videotape rental business closer to perfect competition or monopolistic competition? Give reasons for your answer.
   Probably closer to monopolistic competition because there are differences in the number of videotapes for rent, service, and convenience.

2. What has caused profits in the videotape rental industry to be eliminated in the long run?
   The entry of more firms into the industry. This happens in both perfect competition and monopolistic competition.

Part B.

1. At about what output will this videotape rental firm produce? **About 350** Why?
   Marginal revenue equals marginal cost so the firm will maximize profits at that output.

2. About what price will the firm charge for each videotape rental? **About $4**
   Price and average revenue (AR) are the same thing.

3. Is this firm making a profit? **Yes**
   Price is above ATC.

4. What will happen to price and output in the long-run for this monopolistic competitor?
   Price will decrease and output will increase.

5. How much economic profit will this monopolistic competitor make in the long run? **none**

6. If this videotape rental firm were a perfect competitor, at about what price and output would this firm produce? **Where MC crosses ATC—about $3.30 and 370 videos.** Why?
   This is also break-even, but it is also allocatively and productively efficient. The output is slightly higher than the output of a monopolistic competitor.

7. How does the long-run equilibrium of a monopolistic competitor differ from the long-run equilibrium of a perfect competitor?
   The perfect competitor produces more and is more efficient. The monopolistic competitor breaks even but not where P = MC = ATC.

ACTIVITY 46 **ANSWER KEY**
The Kinked Demand Curve of an Oligopolist

1. At what level of output will this firm operate? **OY**
2. What is the marginal cost at this level of output? **OC**
3. What price will the firm charge for its product? **OF**
4. The area of which rectangle equals total revenue? **OFGY**
5. What is the firm's average cost? **OD**
6. The area of which rectangle is equal to the firm's total cost? **ODJY**
7. The area of which rectangle is equal to the firm's profit? **DFGJ**
8. Suppose the firm is operating at an output level of Y units. How low would marginal costs at Y units of output have to drop before the firm would lower its price? **Below OA**

ACTIVITY 47 **ANSWER KEY**
From Monopolistic Competition to Oligopoly

1. Videotape rental stores produce under what type of market structure?
   Monopolistic competition
   Justify your answer. **Explained in Activity 45.**

2. The new partnerships between phone companies and cable companies produce under what type of competition? **Oligopoly** Justify your answer.
   These new partnerships would be large firms, and the market is only large enough for a few firms of this size.

3. Would you expect the new phone/cable companies to compete on price or product quality? **No** Why?
   Oligopolists probably should prefer to compete on product quality for reasons explained in Activity 46.

4. Suppose the emerging alliances between cable and telephone companies create substitutes for videotape rentals. Trace the impact on videotape rentals in the short run and long run.
   Lower demand would cause videotape rental prices to decline and some firms would shut down. In the long run, the lower market supply may cause the price to rise again, all other things equal.

UNIT 3, LESSON 8
Analyzing Market Structure

Introduction and Description

This lesson helps students apply their knowledge of market structure to conventional and unconventional situations. Activity 48 can be assigned as homework or completed in groups. It is good practice for the complex application questions that are emphasized on the AP test.

Objectives

1. Use the concepts of the theory of the firm to analyze a variety of issues.
2. Analyze the behavior of perfect and imperfect competitors.

Time Required

- One class period

Materials

Activity 48

Procedure

1. Assign Activity 48 a few days before it is due, or have the students complete it in groups.
2. Go over the answers to Activity 48.

ACTIVITY 48 **ANSWER KEY**
Problems on Market Structure and Business

Answer the questions and briefly explain your answers. Feel free to use diagrams to illustrate your point.

1. True, false, or uncertain, and why? "Monopolies always charge the highest possible price."
   ***False.* The monopolist will try to charge a price where marginal revenue equals marginal cost. This is a higher price than a perfect competitor would charge. However, monopolists can't repeal the law of demand. If the monopolist charges too high a price, profits will not be maximized. Students may define "highest possible price" where MR = MC; this answer might be correct.**

2. True, false, or uncertain, and why? "To find a monopoly, look for bigness. For example, monopoly is more likely to be found in the oil business than in the dry cleaning business."
   ***False.* Look for oneness, not bigness. Examples of small monopolies are toll-road restaurants and ballpark concessions.**

3. True, false, or uncertain, and why? "If all the companies in an industry raise their prices at the same time, one can be pretty sure that there is collusion or monopoly behavior in this industry."
   ***False.* If they were perfect competitors, they would all raise their prices at the same time because they have no control over price. If they were oligopolists, their pricing would be interdependent.**

4. After several losing seasons, a college is considering dropping football. To what extent should the college's decision makers consider the following budget items? (Hint: Consider variable and fixed costs.)
   This is a problem on fixed vs. variable costs.

   a. Tuition scholarships
      Tuition scholarships are a variable cost and should be considered.

   b. Payments on the stadium's mortgage
      Mortgage payments are a fixed cost and should not be considered.

   c. Free tickets to the games for students
      A variable cost. If they didn't get free tickets, some would pay for them.

   d. Salary of the athletic director
      A fixed cost although with less responsibilities, he or she might be paid less.

   e. Salary of the football coach and assistant coaches
      A variable cost; it should be considered.

5. True, false, or uncertain, and why? "The marginal cost curve for a perfectly competitive firm is the same thing as its supply curve."
   ***Uncertain.* The marginal cost curve is the same thing as the supply curve for the**

ACTIVITY 48 ANSWER KEY continued

firm as long as it is above the average variable cost curve. Where price = marginal cost, the firm will produce or supply at that output because it maximizes profits there. With a price below the AVC curve, the firm will shut down. A market supply curve is the sum of all the firms' marginal cost curves. Both are upsloping. This is also why changes in costs shift a market supply curve.

6. True, false, or uncertain, and why? "If marginal cost equals marginal revenue, a firm must be breaking even because costs and revenues are equal."
***False*. This statement confuses marginal cost and average total cost. A firm maximizes profits or minimizes losses where marginal revenue equals marginal cost. The firm could be making a profit, breaking even, or losing money where *MR* = *MC*. However, it is doing better there than at any other output level unless price is less than AVC, in which case the output should be zero.**

7. a. What are the fixed and variable costs associated with each level of output?
Fixed cost $1,200. All other costs variable. For example, at an output of 2, fixed cost is $1,200 and variable costs are $150.

   b. What is the optimal production level for the firm?

   c. In the short run, should the firm shut down? Explain your answer.
b. & c. The firm should operate where *MR* = *MC*. This is at an output of 4 and a loss of $1,045. However, this loss is less than the $1,200 it would lose if it shut down. The firm is covering variable costs so should remain open in the short run.

8. Why do airlines charge a discounted fare to passengers who fly standby? (Hint: Consider price discrimination.)
Many airline costs are fixed. The additional passengers probably provide more revenue *(MR)* than the additional cost *(MC)* as long as a lower-priced passenger does not replace a higher-priced passenger. Because air travel is a service and cannot be resold, airlines can price discriminate.

9. Assume your economics teacher got a scholarship to study in Europe this summer. Therefore, the teacher's family wants to rent its house for the summer. They figure if no one rents it, it will still cost them $700 a month in principal, interest, and property insurance. It will cost them an additional $200 a month to maintain it if someone occupies it.

   a. How much rent must they charge to cover all costs?
$900. Total revenue equals total cost.

   b. What is the minimum rent they should be willing to accept before they would leave the house unoccupied? **$200.01** Why?
They will lose less money than they would if they left the apartment empty. This assumes that the $200 in variable costs includes wear and tear on the apartment.

10. True, false, or uncertain, and why? "Without government regulations most firms in a capitalist market system would be monopolies."
***False*. It is very hard to maintain barriers to entry. High profits will attract**

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ACTIVITY 48 ANSWER KEY continued.

other firms to the industry. Very few monopolies have been broken up by government. Yet, except for regulated monopolies, few, if any, monopolies exist in the United States except in local markets. In fact, some foreign governments pass rules that help monopolies stay that way. Government regulations sometimes make competition more difficult.

Answers to Sample Multiple-Choice Questions

1. a
2. a
3. d
4. d
5. e
6. d
7. a
8. e
9. a
10. c
11. e
12. d
13. d
14. c
15. d
16. b
17. d
18. c
19. e
20. c
21. b
22. c
23. b
24. d
25. a
26. d
27. c
28. d
29. e
30. b

Answers to Sample Short Essay Questions

1. 9 points — Talks about and relates the following three main points of the question
    a. how a monopoly sets the price
    b. how a perfect competitor sets the price
    c. defines the "highest price the market will bear" and relates the above discussion to the quotation

8 points — Firm grasp of the concept of profit maximization
May have a minor error
May not relate answer to question asked

7 points — Graph of perfect competition and monopoly models or verbiage
Can explain the idea of profit maximization

6 points — No c. as identified in 9 points
Monopoly model is OK but perfect competition is incomplete
Must discuss profit maximization
To receive a 6 and above, the concept of a monopoly must be correct.

5 points — Neither model is complete or significant errors exist

4 points — More errors than in 5

3 points — One logical, consistent argument

2 points — Contains one distinction between monopoly and perfect competition but is riddled with errors and confusions

1 point — Anything that is correct and at all relevant

Note: Question 1 was a nine-point scale AP question in which students were given 15 minutes to answer the question. Short questions today are graded on a five-point scale. Sample short essay questions 2 and 3 are graded on a five-point scale.

2. Point Method—Basically the point distribution is three points for part a. and two for part b.

Part a.

The airline is operating as a monopoly; the monopolist determines quantity by equating MR = MC and price from the downward sloping demand curve.

1 point — Indicates this is a monopoly explicitly or draws a downward sloping demand curve for the picture.
2 points — Output is determined by MR = MC.
3 points — Price is determined from the demand curve at the output where MR = MC.

Part b.

The increase in fixed costs increases ATC but leaves the MC curve in the same place. Thus, since marginal cost and demand have not changed, the profit-maximizing price and output do not change.

1 point — Price and output remain the same.
2 points — Increase in fixed cost does not change MC.

ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

3. Point Method—Basically the point distribution is two points for part a., two for part b., and one for part c.

Part a.: two points

The marginal revenue curve lies below the demand curve because downward sloping demand curve, price maker/price seeker, or the firm is the market, and the firm must decrease price on all units in order to sell additional units.

1 point — Some version of downward sloping demand curve and a marginal revenue curve that lies below it (a graph is sufficient).

1 point — Firm must decrease price on all units or on all previous units sold in order to sell additional units.

Part b.: two points

Profit-maximizing output is determined where MR = MC, and price is read off the demand curve for this output.

1 point — Quantity is determined where MR = MC.

1 point — Price comes from demand curve at MR = MC quantity.

Part c.: one point

Economic profits can continue to exist in the long run due to barriers to entry. An example of a barrier to entry is sufficient.

4. A perfectly competitive firm is in long-run equilibrium where price equals marginal cost and where price equals average total cost. In addition, the perfectly competitive firm operates at the lowest point on its average total cost curve. In the long run, the perfectly competitive firm is allocatively efficient (P = MC) and technically efficient (minimum ATC).

5. The firm should shut down. If the firm shuts down, it will lose its fixed costs. If price is above average variable cost, the firm's revenue is covering all of its variable costs and some of its fixed costs. Therefore, the firm loses less money by staying open than by shutting down. If the firm operates at a price below average variable cost, the firm's revenue does not cover its variable costs. By staying open, it loses all of its fixed costs and some variable costs. It would lose only its fixed costs if it shut down. If P = AVC, it loses an equal amount by staying open or shutting down, so why stay open?

6. Oligopolists prefer nonprice competition over price competition. Oligopolists are characterized by mutual interdependence. The kinked demand model is designed to illustrate the oligopolist's dilemma. The kinked demand model implies that each oligopolist believes any change in price will be self-defeating. If the oligopolist raises its price, rivals will not follow and will therefore gain market share. If the oligopolist lowers its price, rivals will have to lower their prices in order to keep from losing market share. Therefore, the oligopolist prefers nonprice competition as a safer way of competition.

7. A monopolistic competitor in long-run equilibrium operates where price equals average total cost so it earns zero economic profit in the long run. This long-run equilibrium occurs because one of the characteristics of monopolistic competition is that firms can easily enter or leave the industry (free entry). If monopolistic competitors are earning short-run economic profits, more firms will enter the industry. This increases industry supply, lowers price, and eliminates economic profit. On the other hand, if monopolistically competitive firms are experiencing short-run economic losses, firms will leave the industry to seek economic profits elsewhere. This

ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

decreases industry supply, raises price, and restores normal profits in the long run to the firms remaining in the industry. The monopolistic competitor faces a downward sloping demand curve because of product differentiation. The perfect competitor faces a horizontal demand curve because there is no product differentiation. Because marginal revenue is lower than price and because profits are maximized where marginal revenue equals marginal cost, the monopolistically competitive firm is not allocatively efficient. Because price and marginal revenue are equal, a perfectly competitive firm does operate where P = MC and is allocatively efficient. The monopolistically competitive firm also does not operate at the bottom of its average total cost curve so it also is not productively or allocatively efficient. The perfect competitor does operate at the bottom of its average total cost curve.

8. MR is greater than MC. Each additional unit of output adds more to total revenues than total costs causing losses to decrease or profits to increase. When MR is less than MC, each unit produced adds more to total cost than to total revenues causing profits to decrease or losses to increase. Therefore, profit maximization occurs where MR = MC.

Answers to Sample Long Essay Questions

1. The count-the-points approach: part a., six points; part b., three points.

   Part a.—The components of a good answer are **(i) because the firm is a monopoly it faces a downward sloping demand curve; (ii) because its demand curve is negatively sloping its marginal revenue curve will be more steeply sloping downward; (iii) bring in marginal cost to determine output at MR = MC; (iv) recognize that the profit-maximizing point is MR = MC; (v) read price from the demand curve at the output where MR = MC.**

   In allocating points for Part a, give one point for each of (i)-(iv) parts and two for (v).

   Part b.—The components of a good answer—**(i) a definition of economic efficiency (either allocative efficiency requires P = MC, or productive efficiency is producing at minimum ATC); (ii) correctly relating the definition to the monopoly situation. A monopolist is not efficient by either definition.**

   In allocating points for Part b, one point for the efficiency definition and two points for correctly relating the monopolist situation to the definition of efficiency.

   Special situations:

   (1) There is a possibility that an answer will have efficiency meaning that a producer operates at the least ATC *for a given level of output* and hence the monopolist could be productively efficient....that's okay!....Give three points.

   (2) Answer states that the monopolist is not efficient because it produces too little output and charges too high a price; or, the monopolist restricts output. Give one point for this line of "reasoning."

   (3) If a rudimentary concept of inefficiency is recognized, give one point.

2. The count-the-points approach: part a., four points; part b., five points.

   Part a.—The components of a good answer are **(i) identification of the output at which price or marginal revenue equals marginal cost at the profit-maximizing output, and (ii) identification of long-run equilibrium as zero economic profits (or only normal profits—the exact wording is not important) and an explanation of why there are zero economic profits in long-run equilibrium.**

   The allocation of the four points for part a. would be two for (i), one for identification of the zero profit condition, and one for the explanation of why zero profits exist in long-run equilibrium.

   Part b.—The basic points the answer should make are: **(i) the reduction in variable costs would reduce marginal cost which would cause marginal revenue to equal marginal cost at a higher level of output (in other words, the student should use a marginal revenue/marginal cost argument to motivate the increase in the firm's output caused by the reduction in variable costs), (ii) the increase in output of the individual firms will result in an increase in industry supply, and (iii) the increase in industry supply will cause industry output to rise, and thus industry output to fall.**

   The allocation of the five points for part b. would be two for (i), one for (ii), and two for (iii). If the student simply says that a decrease in costs will cause a producer to increase her output, that would be only one point for (i); if a student says that all of this will increase the output of

ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

AP Question 1 continued

the product and reduce the price of the product without using an increase in supply to motivate these events would receive only one point for (iii).

If the student starts the answer with a nice clear graph for a monopolist, and proceeds to answer the question as if it applied to a monopoly instead of to a perfectly competitive industry, two would be the maximum possible number of points that could be given for the answer, and those two points would be for an identification of the MR = MC position as a maximum profit position. The rest of the question would not effectively apply to a monopolist.

3. In the count-the-points approach, each part is worth three points.

Part a.—The components of a good answer include **(i) an increase in factor input prices increases the cost of production and shifts the industry supply curve to the left (upward); (ii) equilibrium quantity decreases, and (iii) equilibrium price increases.**

Allocate one point for each correct part. There does not have to be an explicit recognition that the wholesale price is a cost.

Part b.—The components of a good answer are **(i) recognizes that the quantity demanded is greater (movement along the demand curve); (ii) recognizes that there is movement along the supply curve (decrease in the quantity supplied); (iii) recognizes that what happens in parts (i) and (ii) creates a disequilibrium situation which could be identified as a shortage or excess demand. The precise language is not crucial. What is important is that the answer recognizes that the price ceiling has changed an equilibrium situation into one of disequilibrium.**

Allocate one point for each correct part.

Special cases:

(1) If merely shortage is mentioned, give it one point.

(2) If the standard price ceiling diagram indicating a shortage or disequilibrium or demand/supply imbalance is given, give the answer three points.

Part c.—The components of a good answer are **(i) there is recognition that since originally the industry was in long-run equilibrium that the increase in costs coupled with the price ceiling results in losses (not merely a decrease in profits); (ii) the losses will drive firms out of the industry (firms will exit).**

Allocating the points:

(1) If the answer indicates that profits are lower and that firms will exit the industry, give one point.

(2) If the answer indicates that the firms are earning less than normal profits (or economic losses) as the result of the price ceiling and hence will exit the industry in the long run, give three points.

(3) If the answer indicates that firms will exit and states more than profits have declined, such as, "the firm is losing money" or "the firm can now do better somewhere else," then two points is an appropriate score.

(4) If there is a general statement about exit or entry into an industry correctly related to the profit/loss situation, give one point.

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ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

4. Point Method: Basically the point distribution is three points for part a.; four for part b.; and two for part c.

Part a.

The industry's supply curve shifts to the right resulting in an increase in equilibrium output and a decrease in equilibrium price. The supply curve shifts to the right because of the decrease in input cost (energy prices).

one point—An explanation that the industry supply curve shifts to the right due to a decrease in costs.
one point—Price declines as a result.
one point—Quantity increases as a result.

Part b.

For the firm: The price decline from the industry carries over to the firm, the MC curve must shift to the right, average costs must decline, profit-maximizing output must increase. The profit situation depends on how the student draws the curves. (Yes, I know it depends on the elasticity of the industry demand curve, BUT THEY do not!)

one point—The firm, as a price taker, has a lowered price equivalent to the decrease in industry price.
one point—Firm produces an increased quantity at MR = MC, as indicated by the new marginal cost curve.
one point—Explains why the marginal cost curve has shifted downward (to the right).
one point—Coherent (consistent) statement about the firm's profits, i.e.,

(a) The firm may show an economic profit if price decreases less than average cost decreases, OR

(b) Profits may be uncertain since both price and average cost decrease, OR

(c) Profits decrease since the price decrease is greater than the average cost decrease but this condition still requires that output increase.

The maximum points for part b. are two if the MC curve doesn't move!!!

Part c.

Profit situation must be consistent with part b. and explanation include entrance if economic profits, uncertainty if profit situation is uncertain, and exit if losses.

one point—Impact on industry, whether firms enter, exit, or is uncertain is consistent with previous discussion.
one point—Correct and consistent explanation for assertion about profits.

Visual 3.1

Types of Market Structure

Market Structure	Number of Firms	Differentiated or Homogeneous Product	Ease of Entry	Price-Setting Power	Non-Price Competition	Examples
Perfect Competition	**many**	**homogeneous**	**free or easy**	**none—price taker**	**none by firm**	**wheat, corn beef, and other agricultural products**
Monopolistic Competiton	**many**	**differentiated**	**relatively easy**	**some discretion—mostly determined by market**	**some**	**fast food, gas, and other retail stores**
Oligopoly	**few**	**homogeneous or differentiated**	**substantial barriers**	**price leadership—some discretion**	**extensive**	**steel, beer, aluminum, cereal, cars, soft drinks, soap**
Monopoly	**one**	**only product of its kind available**	**blocked**	**complete control**	**firm's image—public relations**	**utilities, local phone service**

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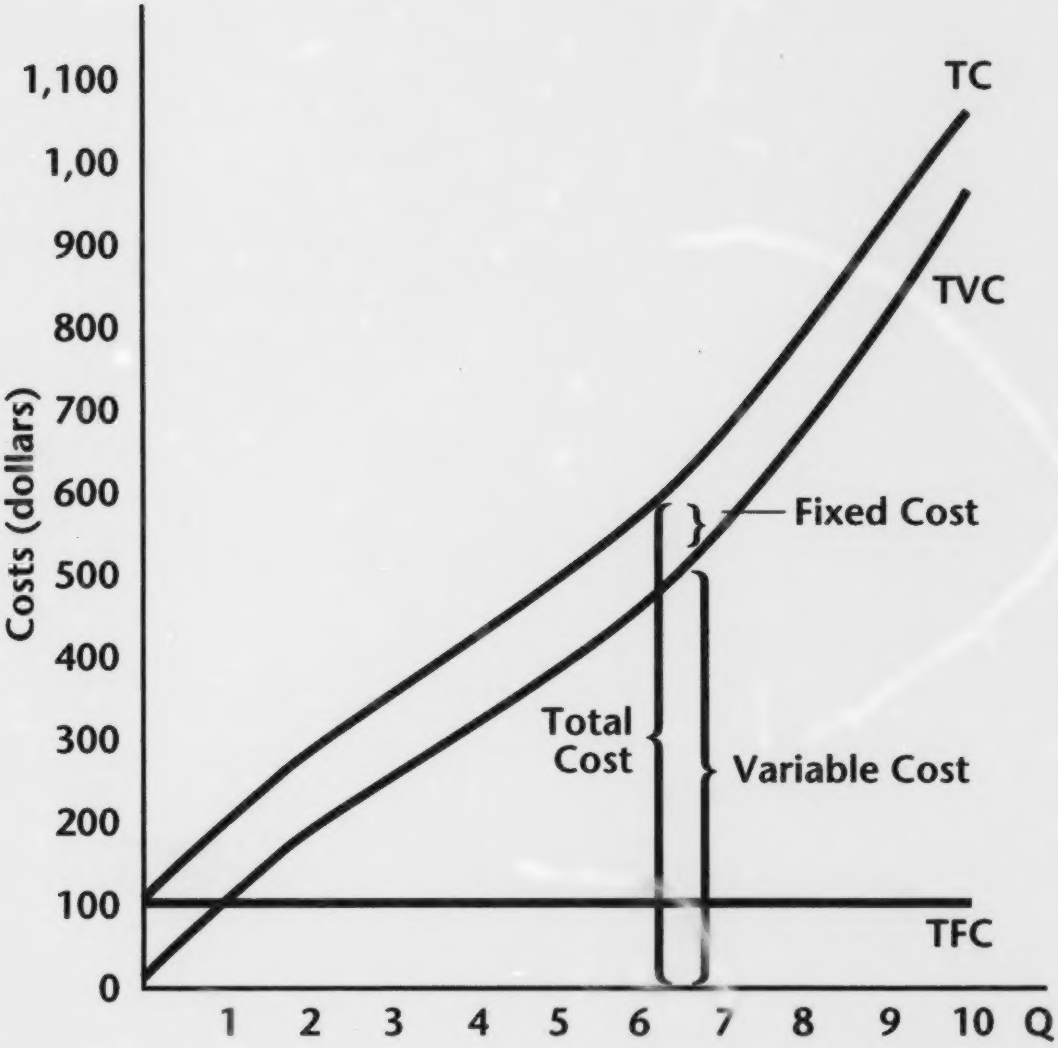
Visual 3.2

Total Fixed, Total Variable, and Total Costs



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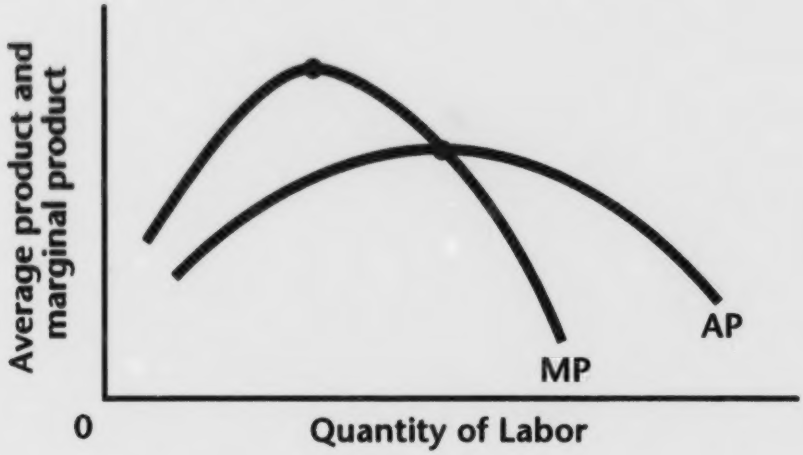
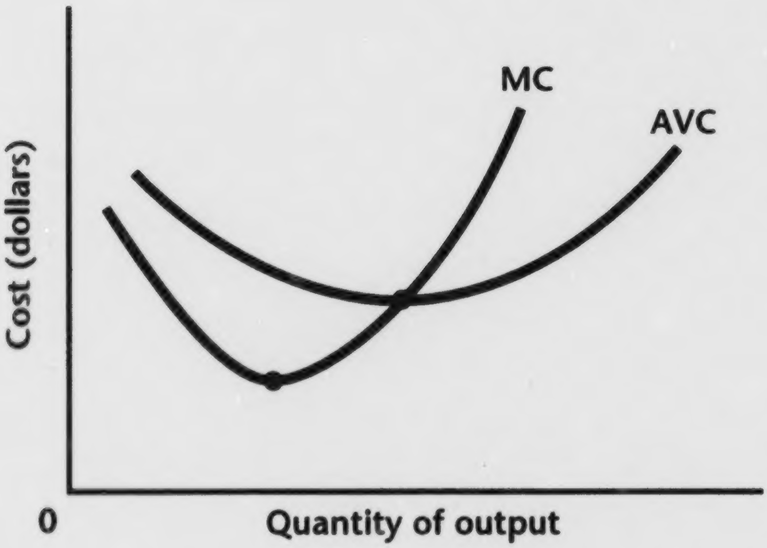
Visual 3.3

Marginal Product and Marginal Cost





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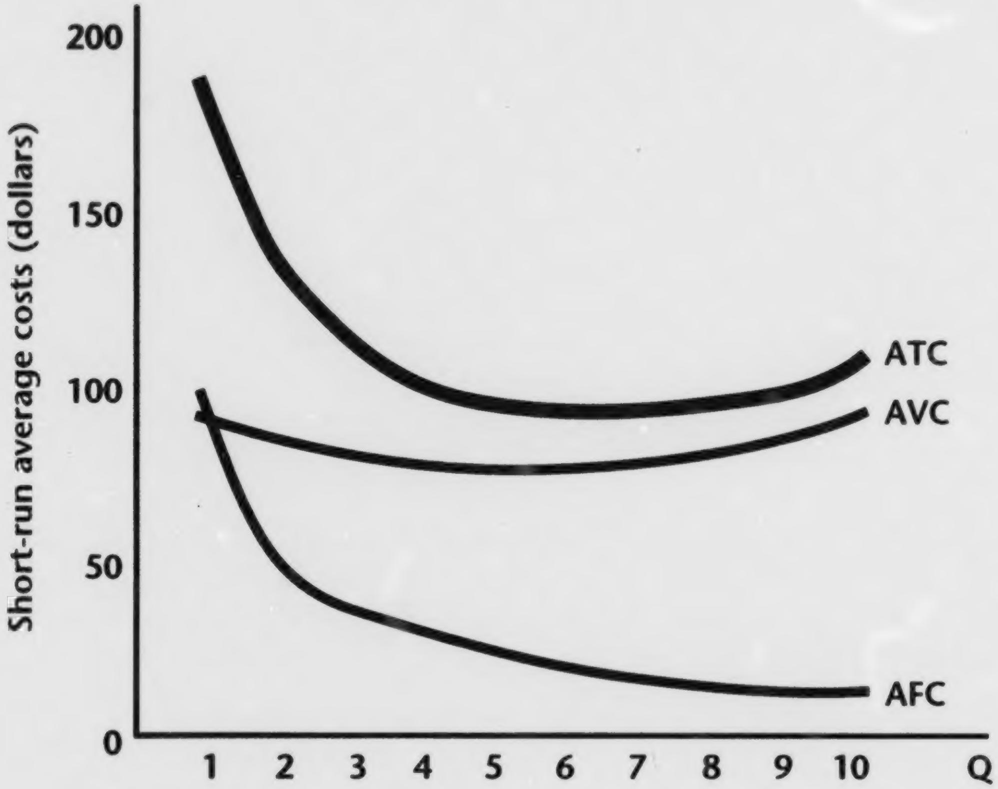
Visual 3.4

Average Fixed, Average Variable, and Average Costs



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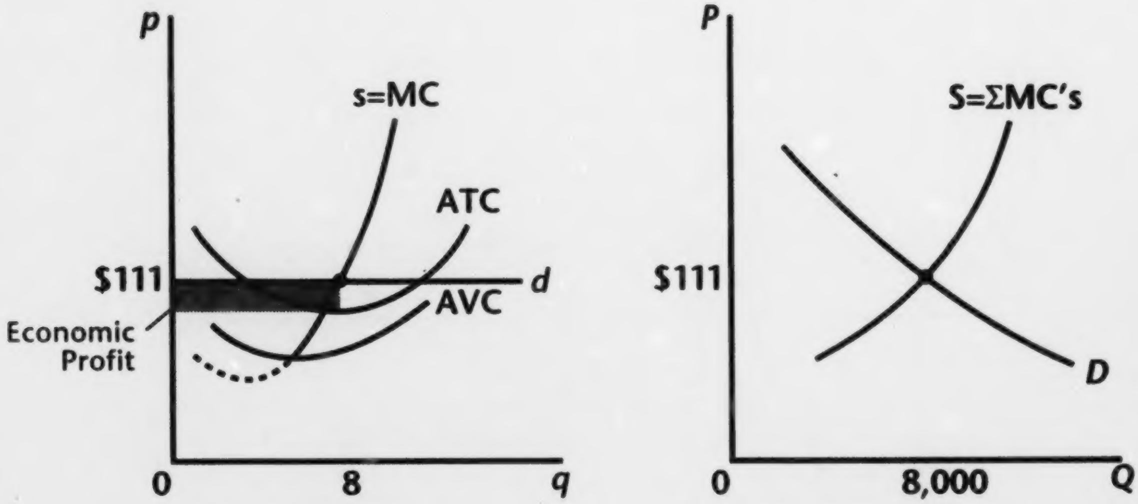
Visual 3.5

The Perfectly Competitive Firm and Industry in Short-Run Equilibrium



(a) Single firm

(b) Industry

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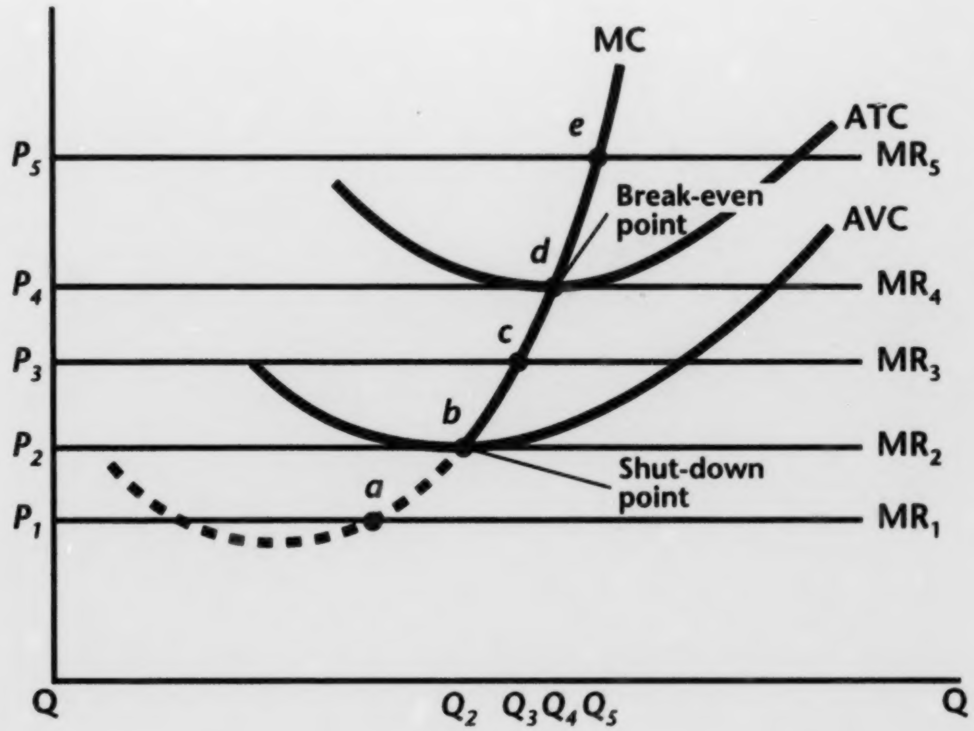
Visual 3.6

Profit, Loss, and Shut-Down



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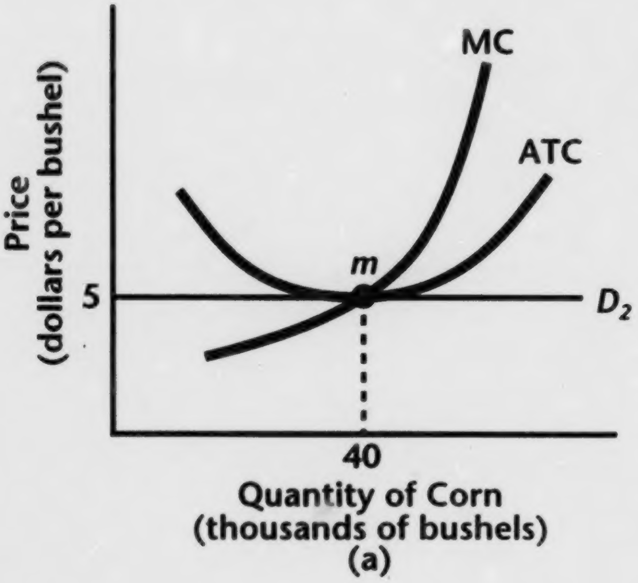
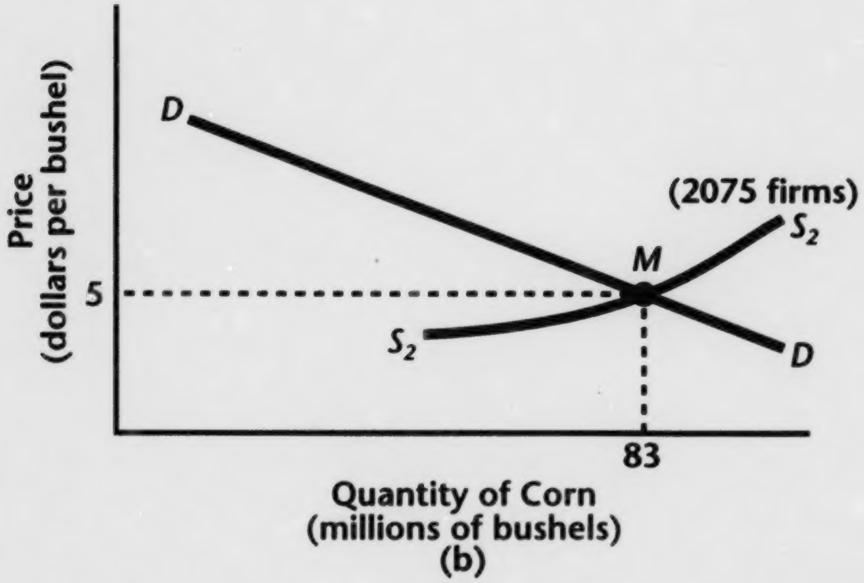
Visual 3.7

The Perfectly Competitive Firm in Long-Run Equilibrium





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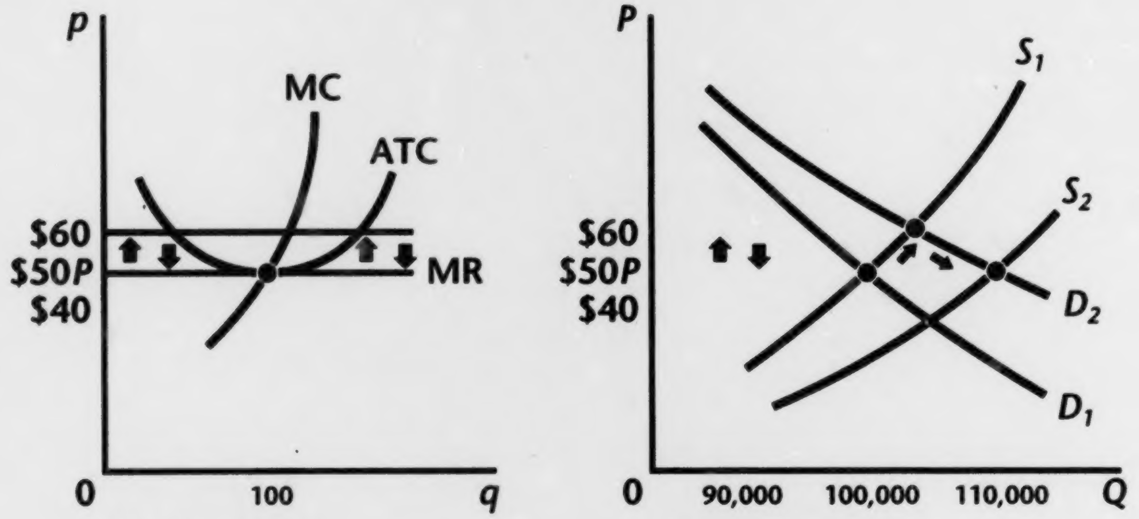
Visual 3.8

How an Increase in Demand Changes Long-Run Equilibrium for the Firm and Industry



(a) Single firm (b) Industry

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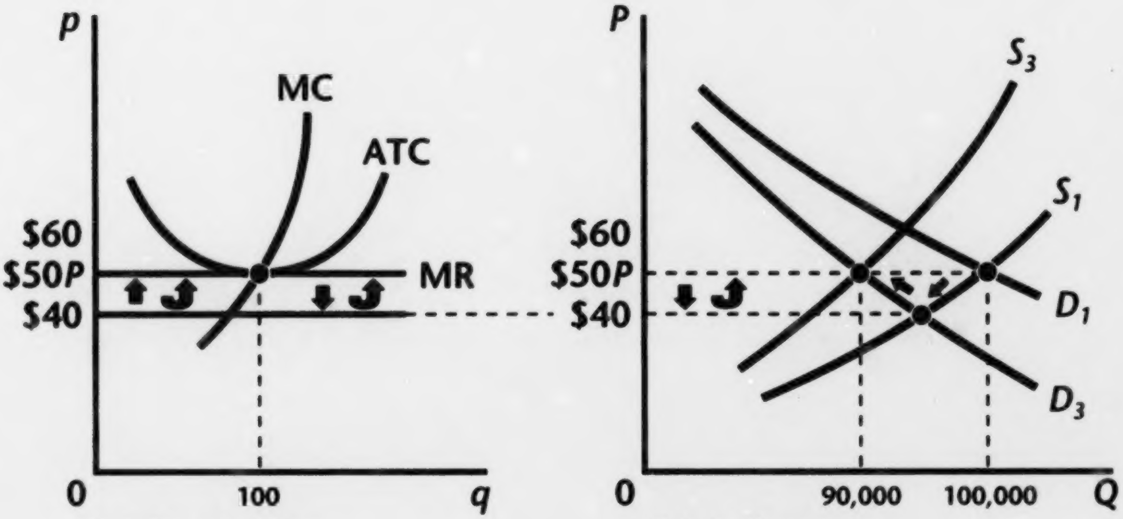
Visual 3.9

How a Decrease in Demand Changes Long-Run Equilibrium for the Firm and Industry



(a) Single firm

(b) Industry

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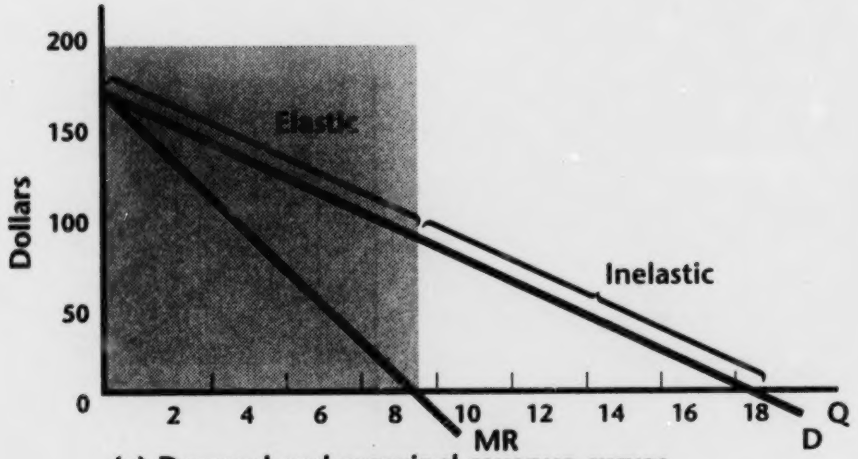
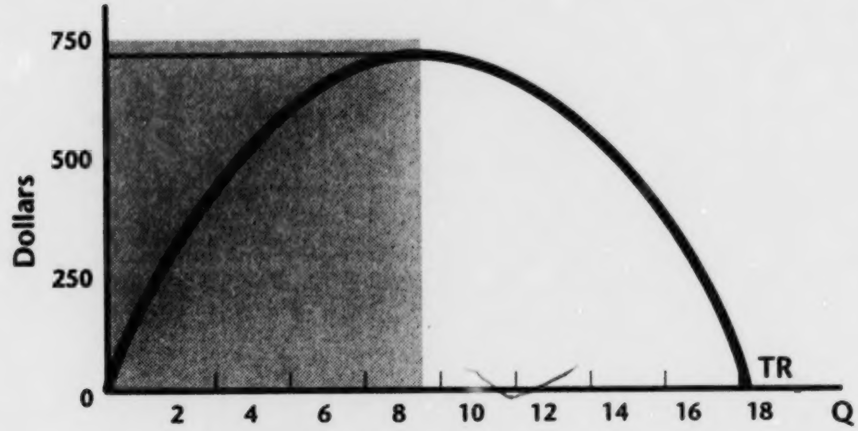
Visual 3.10

Price and Marginal Revenue for a Monopolist



(a) Demand and marginal revenue curves



(b) Total revenue curve

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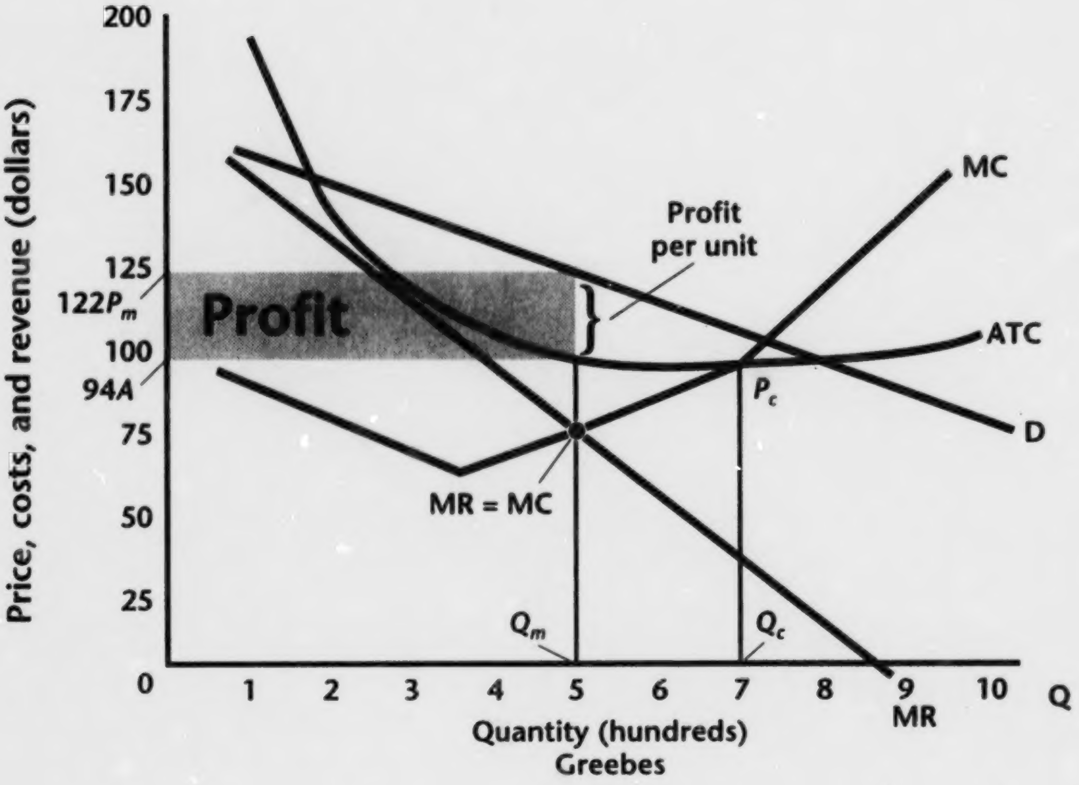
Visual 3.11

The Profit-Maximizing Position of a Monopoly



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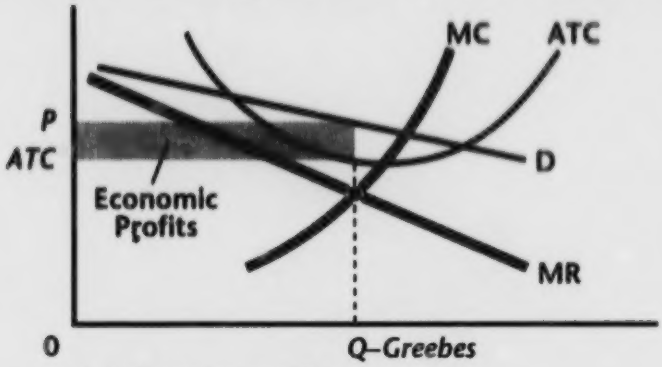
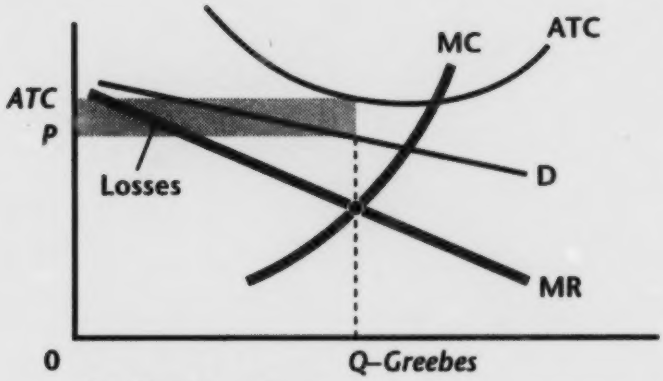
Visual 3.12

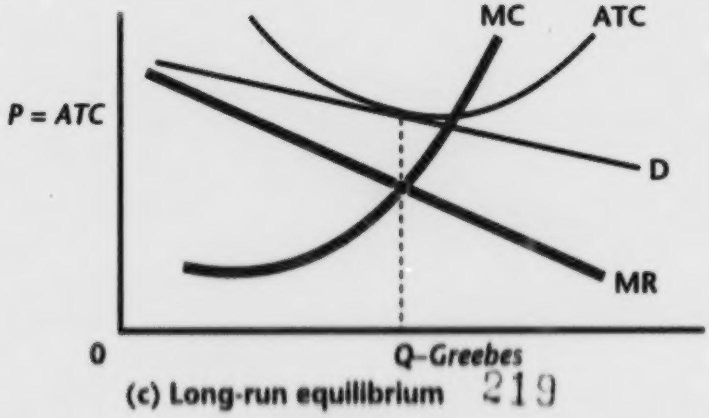
Short-Run and Long-Run Equilibrium for a Monopolistic Competitor



(a) Short-run profits



(b) Short-run losses



(c) Long-run equilibrium 219

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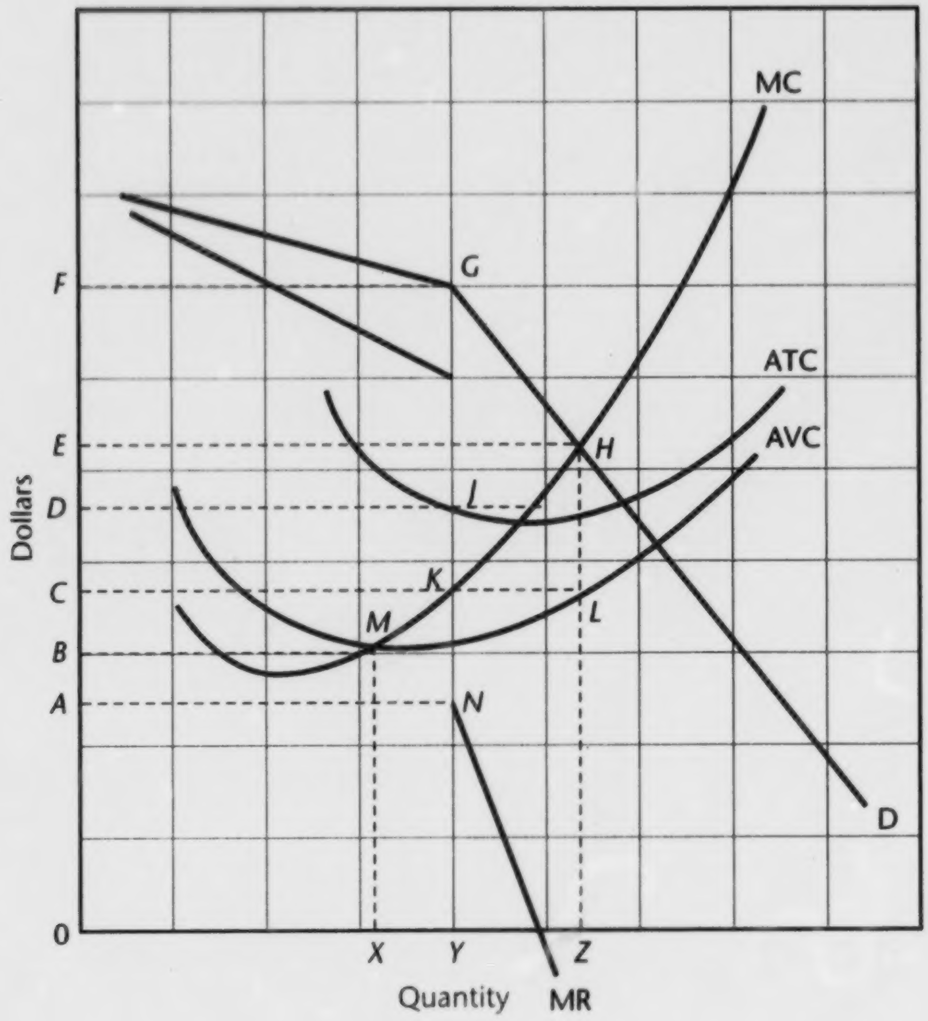
Visual 3.13

The Kinked Demand Curve of an Oligopolist



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Microeconomics

Unit 4

Factor Markets

13 Days

Unit Overview

The basic analytical framework for examining factor markets is similar to the concepts used in the supply and demand unit and the theory of the firm unit. Supply, demand, equilibrium, marginalism, and profit-maximizing are all analyzed again in this unit. The only difference is that they are applied to inputs rather than outputs. Students do not have to learn a lot of new concepts in this unit. Rather, they must apply the concepts already learned in studying product markets to the factor or resource markets.

A key concept in the study of factor markets is marginal productivity analysis, which is used to analyze how wages, rents, interest, and profits are determined. Following the procedure used in most textbooks, wage determination is stressed and used as an example to show how the factors of production are priced. The key is that a firm will hire inputs until marginal revenue product equals marginal resource cost. Activities 49-54 develop marginal productivity theory and provide several applications of these important ideas.

Another part of this unit covers how wages are determined in a perfectly competitive labor market and in a monopsonistic labor market. The effects of minimum-wage laws and union activities are analyzed using both competitive and monopsonistic models. Activities 55-57 are designed to teach these concepts.

Although the major emphasis of the AP exam will be on labor markets, there may also be questions on the other factors of production—land, capital, and entrepreneurship. Activities 58-60 cover how rent, interest, and profits are determined.

Finally, Activity 61 uses complex questions to apply factor market concepts to a variety of conventional and unconventional situations.

Approximately 10 to 15 percent of the AP exam will cover factor markets, with the major emphasis on marginal productivity, derived demand, and wage determination. There have also been essay questions on factor markets on past AP tests.

Textbook Assignments

Baumol and Blinder, Chapters 15 and 16

McConnell and Brue, Chapters 27, 28, and 29

Miller, Chapters 28, 29, and 30

Planning Ahead

Factor market analysis seems very theoretical to students. Here are some ideas that will help them better understand the material.

1. Stress that the same concepts used in supply and demand and in the theory of the firm will be used in analyzing factor markets.
2. Stress the concept of derived demand. The demand for a factor of production is derived from the demand for the good or service produced from it. The more of a thing people buy, the more workers must be hired to produce it, i.e., the greater demand for workers is derived from that buying. The less of a thing people buy, the fewer workers must be hired.
3. Stress wage determination. Concepts such as marginal revenue product and marginal physical product make more sense if students know they can be used to understand how wages and salaries are determined. Most students can relate to wages more than to the other forms of income: rent, interest, and profits. In discussing wages, go beyond marginal productivity theory and analyze the effects that institutions such as unions and government have on wages.

Although this unit lasts 13 days, it might take at least 15 days if you include a discussion of labor unions and the distribution of income.

Unit 4 Activities

Activity 49	Firm in the Middle
Activity 50	The Derived Demand for a Product
Activity 51	How Many Workers Should Be Hired?
Activity 52	The Only (Yo-Yo) Game in Town
Activity 53	Factor Market Pricing
Activity 54	What Is the Optimum Allocation of Resources?
Activity 55	How Wages Are Determined in Competitive Labor Markets
Activity 56	How Wages Are Determined in Monopsonistic Labor Markets
Activity 57	The Effects of Unions on Wages and Employment in Competitive and Monopsonistic Labor Markets
Activity 58	What Do Land, Athletics, and Government Have in Common? The Story of Economic Rent
Activity 59	The Determination of Interest Rates and Their Effect on Investment Decisions
Activity 60	Super Profits
Activity 61	Problems on Factor Markets

Unit 4 Visuals

Visual 4.1	Big Ideas about Factor or Resource Markets
Visual 4.2	Percentage Distribution of National Income—1992
Visual 4.3	The Demand for a Resource: Perfect Competition in the Sale of the Product (hypothetical data)
Visual 4.4	The Demand for a Resource: Imperfect Competition in the Sale of the Product (hypothetical data)
Visual 4.5	The Supply of and Demand for Labor in a Competitive Labor Market
Visual 4.6	The Wage Rate and Level of Employment in a Monopsonistic Labor Market
Visual 4.7	The Determination of Economic Rent

Sample Unit 4 Plan

Week 1	**Week 2**	**Week 3**
1. Go over circular-flow diagram. 2. Use Visual 4.1 to discuss major ideas of factor markets. 3. Have students complete Activity 49. 4. Assign Baumol, Chap. 15; McConnell, Chap. 27; Miller, Chap. 28.	1. Go over Activity 54. 2. Use Visual 4.5 to show how wages are determined in competitive labor markets. 3. Use Visual 4.6 to show how wages are determined in monopsonistic labor markets. 4. Assign Activity 55 and Activity 56.	Go over Activity 61.
1. Go over Activity 49. 2. Use Visual 4.2 to analyze the share of national income that is attributed to wages, rents, and profits. 3. Use Visual 4.3 to discuss how many workers a perfectly competitive firm will hire. 4. Use Visual 4.4 to discuss how many workers an imperfectly competitive firm will hire. 5. Assign Activity 50.	1. Go over Activity 55 and Activity 56. 2. Give a lecture on labor unions. 3. Have students complete Activity 57.	Review for test using Sample Multiple-Choice and Essay Questions.
1. Discuss Activity 50. 2. Give lecture on derived demand. 3. Assign Activity 51 and Activity 52 and Baumol, Chap. 16; McConnell, Chap. 28.	1. Go over Activity 57. 2. Use Visual 4.7 to explain what determines economic rent. 3. Give a lecture on the unique aspect of economic rent. 4. Assign Activity 58.	Unit Test.
1. Discuss Activity 51 and Activity 52. 2. Have students complete Activity 53. 3. Discuss Activity 53.	1. Go over Activity 58. 2. Discuss the role of interest rates in a market economy. 3. Have students complete Activity 59.	
1. Give a lecture on allocating multiple inputs. Discuss the least-cost profit-maximizing combination of resources. 2. Assign Activity 54 and McConnell, Chap. 29; Miller, Chap. 30.	1. Discuss Activity 59. 2. Discuss the role of profits in a market economy. 3. Have students complete Activity 60 and discuss it. 4. Assign Activity 61 as homework, or have students complete it in groups.	

UNIT 4, LESSON 1

An Introduction to Factor Markets

Introduction and Description

Students can understand factor or resource markets better if they gain an overall perspective before getting into the details of marginal productivity theory. In this lesson, students learn that a firm is both a seller in the product market and a buyer in factor markets. Second, this lesson brings out some key ideas in order to give structure to the lessons that follow.

Objectives

1. Describe the difference between *factor markets* and *product markets*.
2. Describe the difference between a *monopoly* and a *monopsony*.
3. Provide examples of what is bought and sold in a product market and in a factor market.
4. Obtain an overview of the factor market unit.
5. Describe the relative shares of national income attributed to land, labor, capital, and entrepreneurship.

Time Required

- One and one-half class periods

Materials

1. Activity 49
2. Visuals 4.1 and 4.2

Procedure

1. Project a visual of a circular-flow diagram (such as the one in Activity 49) while you describe a factor market and how it is related to a product market.
2. Project Visual 4.1 and discuss some of the major ideas regarding factor markets.
3. Have the students read Activity 49 and answer the questions.
4. Discuss the answers to the questions in Activity 49.
5. Project Visual 4.2 and emphasize that wages account for three-fourths of the nation's income. The large share of wages in national income is the reason labor is emphasized so much in this unit. Students often believe profits are much larger than they are. Profits (proprietors' income plus corporate profits) account for a little less than 17 percent of national income.

ACTIVITY 49 **ANSWER KEY**
Firm in the Middle

Part A.

Use the *Firm in the Middle* diagram to answer the questions that follow.

1. What is the difference between a factor market and a product market?
Resources (land, labor, capital, and entrepreneurship) are bought and sold in factor markets. Goods and services are bought and sold in product markets.

2. What determines how much land, labor, and capital a firm will hire?
The amount of revenue it can earn by selling the goods and services that are produced using these resources, and also by the relative prices of land, labor, and capital.

3. What is the difference between monopoly and monopsony?
A monopoly means one seller. A monopsony means one buyer.

4. Can a firm be a monopoly in the product market and a competitor in the factor market?
Yes.

Part B.

Use the model *Circular Flow for Products and Resources* to answer the questions that follow.

1. Give an example of something that is bought and sold in the product market.
Answers will vary, but it must be a good or a service.

2. Give an example of something that is bought and sold in the factor or resource market.
Answers will vary, but it must be a factor of production.

3. How is demand in the resource or factor market related to demand in the product market?
The greater the demand for a product, the greater the demand for the factor of production.

UNIT 4, LESSON 2

How Resource Prices Are Determined: Marginal Productivity Theory

Introduction and Description

Marginal productivity theory is the heart of the factor market unit. Students must master the details of marginal productivity and complex terminology such as *marginal physical product, marginal revenue product, marginal resource cost,* and the *MRP = MRC* rule before they can grasp the main concepts. Furthermore, students must understand that the demand for a resource is derived from the demand for the goods and services produced by that resource. Finally, students must understand how a firm hires resources when more than one resource is involved. The material covered in this lesson is the most heavily emphasized among the factor market questions on the AP test.

Objectives

1. Define *derived demand, marginal revenue product, marginal physical product,* and *marginal resource cost.*
2. Given data, construct a marginal physical product schedule and a marginal revenue product schedule for a resource purchased in a perfectly competitive resource market when the product is sold in a perfectly competitive product market.
3. Given data, construct a marginal physical product schedule and a marginal revenue product schedule for a resource purchased in a perfectly competitive resource market when the product is sold in an imperfectly competitive product market.
4. State the principle employed by a profit-maximizing firm to determine how much of a resource it will employ.
5. Given data, determine how much of a resource the firm will employ.
6. Given data, state and use the principle employed by a firm to develop the least-cost profit-maximizing combination of resources.
7. Predict the effect of various events on the demand for a resource.

Time Required

- Four class periods

Materials

1. Activities 50, 51, 52, 53, and 54
2. Visuals 4.3 and 4.4

Procedure

1. Use Visual 4.3 to explain how many workers a firm will hire if it is perfectly competitive in both the resource market and the factor market. Organize your lecture around questions such as these:
   a. What is marginal physical product?
   b. Why does marginal physical product decline as output increases?
   c. What is marginal revenue product?
   d. How is marginal revenue product calculated?
   e. Why does marginal revenue product decline as output increases?
2. Explain the profit-maximizing rule for employing resources: MRP = MRC.
3. Still using Visual 4.3, ask how many workers would be hired if the wage were:

   $13.95 (one worker)

   $11.95 (two workers)

   $9.95 (three workers)

   $7.95 (four workers)
4. Now use Visual 4.4 to discuss how a firm maximizes profits if it is a perfect competitor in the resource market but sells in an imperfectly competitive market. Ask questions such as these:
   a. What is the evidence that this is an imperfectly competitive product market?
   b. Why does the MRP of the imperfectly competitive firm fall more rapidly than

LESSON 2 continued

the MRP of the perfect competitor?

   c. What are the implications of this?

5. Still using Visual 4.4, ask how many workers would be hired if the wage were:

   $13.95 (one worker)

   $11.95 (two workers)

   $9.95 (two workers)

   $7.95 (three workers)

6. Ask: Given the same costs, what can we conclude about the number of workers hired in perfectly competitive product markets compared to imperfectly competitive product markets? (More workers will be hired under perfectly competitive product markets.)

7. Assign Activity 50 as homework.

8. Go over Activity 50. In this discussion, cover these points.

   a. Why is the MRP or the demand for a resource downsloping?

   b. The factors that can shift the demand for a resource

      1) Change in the product price

      2) Change in productivity

      3) Changes in the price of substitute or complementary resources depending on the substitution effect and the output effect

   c. The determinants of the elasticity of resource demand

      1) Rate of MRP decline

      2) Elasticity of product demand

      3) Ease of resource substitutability

      4) The proportion of total costs that the resource represents

9. Assign Activities 51 and 52 as homework.

10. Discuss Activities 51 and 52.

11. Have the students complete Activity 53.

12. Discuss Activity 53.

13. Have the students complete Activity 54.

14. Discuss the answers to Activity 54.

ACTIVITY 50 **ANSWER KEY**
The Derived Demand for a Product

The key to understanding how resources are priced in the factor markets is to see the relationship between demand in the factor market and demand in the product market.

The demand for a resource (land, labor, capital, or entrepreneurship) is called *derived demand* because it is derived from the demand for the goods and services that are produced by these resources. To be more specific, the demand for any resource is the downward sloping portion of the marginal revenue product curve. Let's examine why this is so.

1. Complete the following chart *Data for a Yo-Yo Manufacturer*. The firm operates in a perfectly competitive factor market and in a perfectly competitive product market. In a perfectly competitive factor market, market supply and demand determine the price of the factors of production, and in a perfectly competitive product market, supply and demand determine the price of the product.

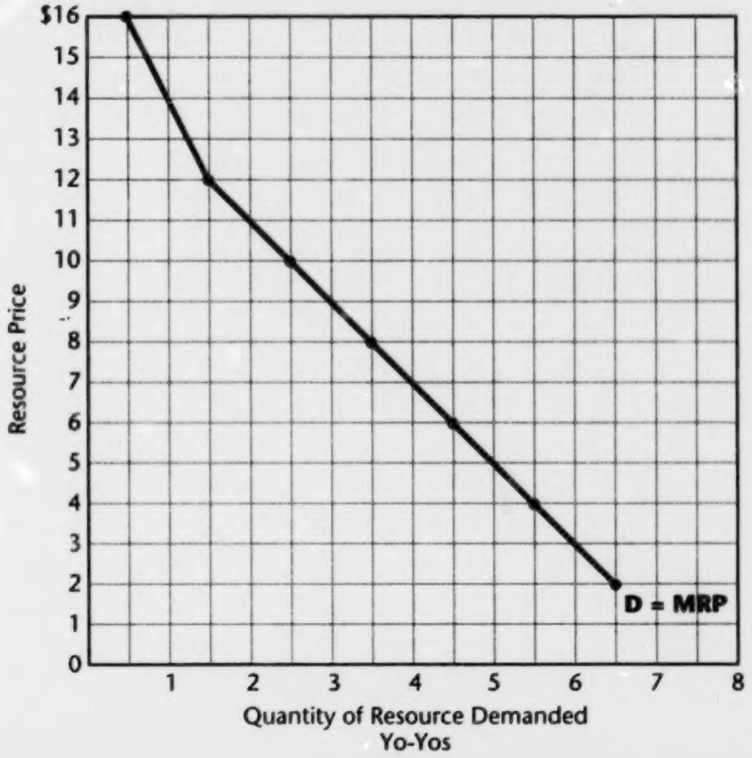
Data for a Yo-Yo Manufacturer

Units of Resource	Total Product	Marginal Physical Product (Marginal Product)	Product Price	Total Revenue	Marginal Revenue Product
0	0		$2.00	$0	
		8			16
1	8		$2.00	$16	
		6			12
2	14		$2.00	$28	
		5			**10**
3	19		$2.00	**$38**	
		4			**8**
4	23		$2.00	**$46**	
		3			**6**
5	26		$2.00	**$52**	
		2			**4**
6	28		$2.00	**$56**	
		1			**2**
7	29		$2.00	**$58**	

ACTIVITY 50 ANSWER KEY continued

2. Use the answers you got in the last column of the chart on the preceding page to graph marginal revenue product on *Plotting Resource Price and Quantity for Yo-Yos*. Label the MRP curve, "MRP = D."

Plotting Resource Price and Quantity for Yo-Yos



3. MRP depends on two variables. One is marginal physical product (MPP), sometimes referred to as marginal product. The second variable is the price of the good or service being produced. For each of the following situations, indicate whether the demand for a resource would increase or decrease.

   a. A new yo-yo machine increases productivity. **Increase**

   b. The price of yo-yos increases. **Increase**

   c. Better training increases the efficiency of yo-yo workers. **Increase**

   d. The demand for yo-yos increases. **Increase**

   e. New technology increases the output of yo-yo workers. **Increase**

   f. Consumers tire of yo-yos. **Decrease**

ACTIVITY 51 **ANSWER KEY**
How Many Workers Should Be Hired?

How Many Workers to Hire for $2 Yo-Yos

1 Number of workers hired	2 Level of output (number of yo-yos produced per day)	3 Marginal Physical Product (Extra output from hiring one more worker)	4 Price at which yo-yos can be sold	5 Total Revenue (P x Q, or col. 4 x col. 2)	6 Marginal Revenue Product (col. 3 x col. 4)
0	0		$2.00	$0	
		20			$40
1	20		$2.00	($20 x 2) = $40	
		30			**$60**
2	50		$2.00	**($50 x 2) = $100**	
		20			**$40**
3	70		$2.00	**($70 x 2) = $140**	
		15			**$30**
4	85		$2.00	**($85 x 2) = $170**	
		10			**$20**
5	95		$2.00	**($95 x 2) = $190**	
		5			**$10**
6	100		$2.00	**($100 x 2) = $200**	

1. Why does the number of extra yo-yos produced decrease as more workers are hired?
   Because of diminishing marginal returns.

2. If the wage is $25 per day, how many workers should Acme hire? **4** Why?
   Profit is maximized where MRP = wage. At four workers, MRP is $30 and the wage is $25. At five workers, MRP is $20 and the wage is $25. It does not pay to hire the fifth worker.

3. If the demand for yo-yos increases so that Acme can sell as many yo-yos as it wants for $3 each, what effect will this have on Acme's level of employment?
   It will now hire five workers. At $3, MRP for five workers is now $30 rather than $20 so the higher price makes it profitable to hire the fifth worker.

4. In order to make as much profit as possible, a firm should hire an additional worker as long as that worker's **marginal revenue product** is greater than his or her **wage** .

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ACTIVITY 52 **ANSWER KEY**
The Only (Yo-Yo) Game in Town

How Many Workers to Hire for Varying Price Yo-Yos

1 Number of workers hired	2 Level of output (number of yo-yos produced per day)	3 Marginal Physical Product (Extra output from hiring one more worker)	4 Price at which yo-yos can be sold	5 Total Revenue (P x Q, or col. 4 x col. 2)	6 Marginal Revenue Product (the change in total revenue from previous level)
0	0		$0.00	$0	
		20			$100
1	20		$5.00	(20 x $5) = $100	
		30			**$100**
2	50		$4.00	**(50 x $4) = $200**	
		20			**$45**
3	70		$3.50	**(70 x $3.50) = $245**	
		15			**$10**
4	85		$3.00	**(85 x $3) = $255**	
		10			**–$65**
5	95		$2.00	**(95 x $2) = $190**	
		5			**–$90**
6	100		$1.00	**(100 x $1) = $100**	

1. How does Acme's demand for labor differ from when its product sold for $2 each?
Acme's demand schedule for labor, which is also its MRP schedule, now declines both because of the law of diminishing returns and because Acme must now lower its price to sell more. The demand for labor is less elastic because the demand for Acme's product is less elastic.

2. Acme's decision-making rule is the same: If an additional worker adds more to revenue than cost, this worker should be hired. If Acme can still hire workers at $25 per day, how many workers should Acme hire? __**3**__ Why?
Beyond that level, workers don't generate enough additional revenue to cover the cost of hiring them.

ACTIVITY 53 **ANSWER KEY**
Factor Market Pricing

Part A.

1. Fill in the blank spaces in the table *Number of Workers Hired in a Competitive Market.* Note that marginal figures are placed between levels of employment.

2. If the product of this firm sells for $3.00 in a purely competitive market and the costs for wages and benefits for each worker hired are $60 per day, how many workers would be hired? **6**

3. At this employment level, total wage and benefit cost is $ **360** per day; total revenue is $ **480** ; and the difference is $ **120** .

4. What is the daily wage and benefit cost below which a seventh worker would be hired? $ **45**

5. If the price of the competitive firm's product increased to $5.00, how many workers would be hired at a wage and benefit cost of $60.00 a day? **7**

Number of Workers Hired in a Competitive Market

Employment No. of Workers (L)	Total Output per Day (Q)	Marginal Physical Product (ΔQ/ΔL)	Marginal Revenue Product (ΔR/ΔL)	
			P = $3.00	P = $5.00
0	0			
		20	$60	$100
1	20			
		30	**90**	150
2	50			
		35	105	**175**
3	85			
		30	**90**	**150**
4	115			
		25	75	**125**
5	140			
		20	**60**	100
6	160			
		15	45	**75**
7	175			
		10	**30**	**50**
8	185			
		5	15	**25**
9	190			
		0	**0**	0
10	190			
		-5	-15	-25
11	185			

ACTIVITY 53 ANSWER KEY continued

Part B.
Assuming that there is a competitive market at Siwash University, graduate students can earn money by working for professors as Research Assistants (RAs) or as Teaching Assistants (TAs). A survey gives the following results:

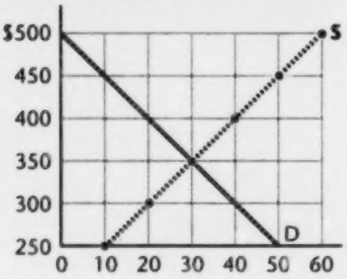
RAs Who Would Be Hired

Monthly Salary	No. of Grad Students Professors Would Hire (D)	No. of Grad Students Who Would Work (S)
$500	0	60
450	10	50
400	20	40
350	30	30
300	40	20
250	50	10

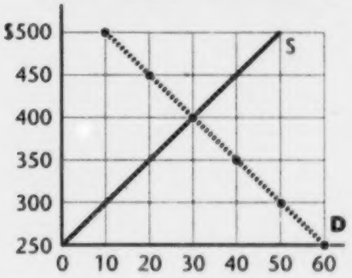
TAs Who Would Be Hired

Monthly Salary	No. of Grad Students Professors Would Hire (D)	No. of Grad Students Who Would Work (S)
$500	10	50
450	20	40
400	30	30
350	40	20
300	50	10
250	60	0

RAs–Supply and Demand



TAs–Supply and Demand



Follow directions, fill in the answer blanks, or cross out the incorrect words in parentheses.

1. Draw in the supply curve of RAs (left diagram) and label it "S."
2. Draw in the demand curve for TAs (right diagram) and label it "D."
3. a. The equilibrium wage for RAs is $ **350** .
   b. The equilibrium wage for TAs is $ **400** .
4. At these wages how many students would be hired? as RAs **30** as TAs **30**
5. Suppose research assistants formed a union and agreed not to work unless they received $400 a month.
   a. How many RAs would be employed at $400 a month? **20**
   b. How many previously employed RAs would be out of a job at $400 a month? **10**

ACTIVITY 53 ANSWER KEY continued

6. If these unemployed RAs start looking for work as TAs, what would happen in the TA market at the old equilibrium wage? There would be an excess *(~~demand~~/supply)*.
7. Under these circumstances, what would you expect to happen to the equilibrium wage of TAs? It would tend to *(~~rise~~/fall)*.
8. In the TA market, would this be a shift in the supply curve or a move along it? *(shift/~~move~~)*
9. If more TAs are employed at a new equilibrium wage rate, would this be the result of a shift in the demand curve or a move along it? *(~~shift~~/move)*

ACTIVITY 54 **ANSWER KEY**
What Is the Optimum Allocation of Resources?

1. The table *Total Production Employing Varying Amounts of Resource A* shows the total production a firm will be able to obtain if it employs varying amounts of resource A while the amounts of the other resources the firm employs remain constant.
   a. Compute the marginal product of each of the seven units of resource A and enter these figures in the table.
   b. Assume the product the firm produces sells in the market for $1.50 per unit. Compute the total revenue of the firm at each of the eight levels of output and the marginal revenue product of each of the seven units of resource A. Enter these figures in the table.

Total Production Employing Varying Amounts of Resource A

Quantity of Resource A employed	Total product	Marginal product of A	Total revenue	Marginal revenue product of A
0	0		$ **0.00**	
		12		$ **18.00**
1	12		**18.00**	
		10		**15.00**
2	22		**33.00**	
		8		**12.00**
3	30		**45.00**	
		6		**9.00**
4	36		**54.00**	
		4		**6.00**
5	40		**60.00**	
		2		**3.00**
6	42		**63.00**	
		1		**1.50**
7	43		**64.50**	

   c. On the basis of your computations, complete the firm's demand schedule for resource A by indicating in the table *Demand Schedule for Resource A* the number of units of resource A the firm would employ at the given prices.

Demand Schedule for Resource A

Price of A	Quantity of A demanded
$21.00	**0**
18.00	**1**
15.00	**2**
12.00	**3**
9.00	**4**
6.00	**5**
3.00	**6**
1.50	**7**

ACTIVITY 54 ANSWER KEY continued

2. The table *Marginal Product Data for Resource B* shows the marginal product data for resource B. Assume that the quantities of other resources employed by the firm remain constant.

   a. Compute the total product (output) of the firm for each of the seven quantities of resource B employed and enter these figures in the table.

   b. Assume that the firm sells its output in an imperfectly competitive market and that the prices at which it can sell its product are those given in the table.

   Compute and enter in the table:

   1) Total revenue for each of the seven quantities of B employed.

   2) The marginal revenue product of each of the seven units of resource B.

   c. How many units of B would the firm employ if the market price of B were:

   1) $25 **0**
   2) $20 **1**
   3) $15 **2**
   4) $9 **3**
   5) $5 **4**
   6) $1 **4**

Marginal Product Data for Resource B

Quantity of resource B employed	Total product	Marginal product of B	Product price	Total revenue	Marginal revenue product of B
0	0	—		$ 0.00	—
		22			$**22.00**
1	22		$ 1.00	$**22.00**	
		43			$**16.70**
2	21		.90	$**38.70**	
		62			$**10.90**
3	19		.80	$**49.60**	
		78			$ **5.00**
4	16		.70	$**54.60**	
		90			–$ **.60**
5	12		.60	$**54.00**	
		97			–$ **5.50**
6	7		.50	$**48.50**	
		98			–$ **9.30**
7	1		.40	$**39.20**	

ACTIVITY 54 ANSWER KEY continued

3. The table *Marginal Revenue Data for Resources C and D* shows the marginal product and marginal revenue product schedules for resources C and D. Both resources are variable and are employed in purely competitive markets. The price of C is $2 and the price of D is $3. Resources C and D are substitutable.

Marginal Revenue Data for Resources C and D

Quantity of resource C employed	Marginal product of C	Marginal revenue product of C	Quantity of resource D employed	Marginal product of D	Marginal revenue product of D
1			1		
	10	$5.00		21	$10.50
2			2		
	8	4.00		18	9.00
3			3		
	6	3.00		15	7.50
4			4		
	5	2.50		12	6.00
5			5		
	4	2.00		9	4.50
6			6		
	3	1.50		6	3.00
7			7		
	2	1.00		3	1.50

a. The least-cost combination of C and D that would enable the firm to produce:

1) 64 units of its product is **1** C and **3** D.
2) 99 units of its product is **3** C and **5** D.

b. The profit-maximizing combination of C and D is **5** C and **6** D.

c. When the firm employs the profit-maximizing combination of C and D, it is also employing C and D in the least-cost combination because **the marginal revenue product of C divided by its price** equals **the marginal revenue product of D divided by its price**.

d. Examination of the figures in the table *Marginal Revenue Data for Resources C and D* reveals that the firm sells its product in a **perfectly** competitive market at a price of **$.50**.

e. Employing the profit-maximizing combination of C and D, the firm's:

1) Total output is **114**.
2) Total revenue is **$57**.
3) Total cost is **$28**.
4) Assuming resources C and D are the only inputs, total profit is **$29**.

ACTIVITY 54 ANSWER KEY continued

4. Acme Yo-Yo, Inc., can hire labor for $2 per unit and capital at $4 per unit. The firm can produce 50 yo-yos using any one of the three following combinations of factors:

Method of Production

	A	B	C
Units of labor	2	5	6
Units of capital	9	7	5

a. Should Acme use method A, B, or C? **C** Why?
It has the lowest cost.

b. How much profit will Acme make if it uses its most profitable combination and sells the yo-yos for $1 each? **$18 ($50 – $32 = $18)**

Combination A—$4 labor + $36 capital = $40

Combination B—$10 labor + $28 capital = $38

Combination C—$12 labor + $20 capital = $32

UNIT 4, LESSON 3

Competition vs. Monopsony: The Effects of Resource Market Structure on Wages and Employment

Introduction and Description

Until now, students have studied only the perfectly competitive resource market. What happens if the resource market is not perfectly competitive? In this lesson, monopsony is compared to perfect competition. To illustrate the differences between these markets, students study the effects of minimum wages and union activities in competitive and monopsonistic markets.

Objectives

1. Understand what determines the wage rate and level of employment in competitive labor markets.
2. Understand what determines the wage rate and level of employment in monopsonistic labor markets.
3. Compare the wage level and employment level in a competitive labor market to the wage level and employment level in a monopsonistic labor market.
4. Analyze the effects of a minimum wage law in competitive and monopsonistic labor markets.
5. Analyze the effects of labor union tactics in competitive and monopsonistic labor markets.

Time Required

- Two class periods

Materials

1. Activities 55, 56, and 57
2. Visuals 4.5 and 4.6

Procedure

1. Use Visual 4.5 to show how wages are discovered in a competitive labor market for both the industry and the firm. Ask questions such as these:
    a. What determines the wage in a competitive labor market?
    b. Why is the supply curve for an individual firm in a competitive labor market horizontal or perfectly elastic?
    c. Why is the supply curve for labor upsloping?
    d. Why are the demand curve for labor and the MRP for labor the same thing?
    e. Why is the market demand curve for labor downsloping?
2. Use Visual 4.6 to show how wages are determined in a monopsonistic labor market. Ask questions such as these:
    a. Why is MRC higher than the firm's supply of labor curve?
    b. What would be the wage level and employment level if this firm were buying labor in a perfectly competitive market?
    c. What quantity of labor would be purchased in a monopsonistic labor market? Why?
    d. What is the wage level in a monopsonistic labor market? Why?
3. Assign Activities 55 and 56 as homework.
4. Discuss Activities 55 and 56.
5. Introduce the concept of a labor union. Briefly define and differentiate between craft and industrial unions. Briefly discuss the history of labor unions.
6. Have students complete Activity 57.
7. Using the answers to Activity 57, discuss the effects of unions on competitive and monopsonistic markets with questions such as these:
    a. Which of the union goals has the most

LESSON 3 continued

favorable impact on existing employees? (The most favorable impact is to increase wages and employment of union members. Hence any strategy that attempts to increase the demand for labor would be most favorable for existing members. Yet it may be argued that collective bargaining strategies that negotiate a wage rate higher than the previous equilibrium may be beneficial to them but sacrifices employment opportunities of future union members or members with the least seniority.)

b. Which of the union goals is most restrictive in the number of people who might want to enter the labor market? (The most restrictive strategy is for the union to restrict the number of employees in the profession; hence state certification requirements or occupational licensing restricts future entry into the professions.)

c. Which union goal seems to have an effect similar to a minimum wage? (The goal with an effect similar to a minimum wage occurs when unions attempt to negotiate wages in competitive labor markets above the equilibrium wage rate. Some members may receive a higher wage rate but only at the cost of employment of other members.)

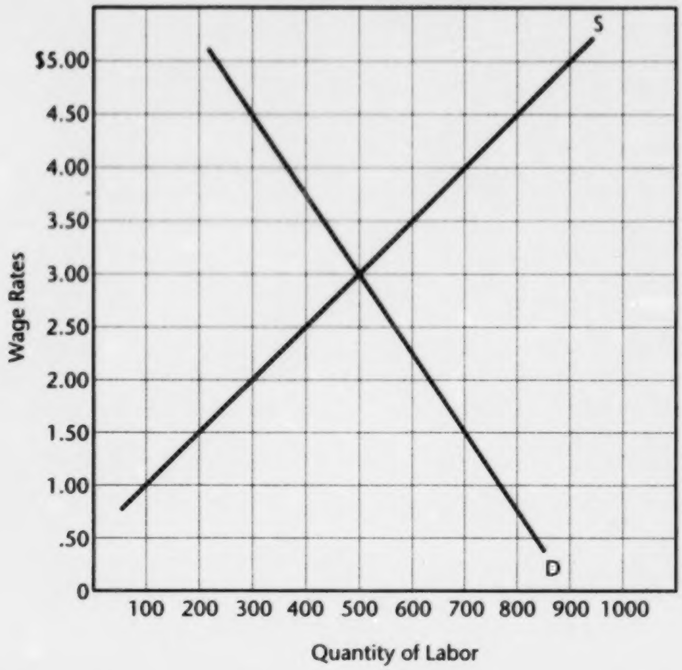
d. Which union goal has the largest positive effect on the wage rate and the number of laborers employed? (The largest positive effect on wage rates and employment comes from increasing the demand for labor, either by increasing the product price or by increasing the productivity of their workers. Given that labor unions are only a small share of the product market, it is not probable that they can easily influence the demand for—and hence the price of—the product. However, some unions have supported advertisements for their products. The increase in productivity of laborers is also difficult to accomplish, given that the increases in productivity are the result of changes in technology and the amounts of capital used in the production process. Education and training—investments in human capital—can also increase productivity. Labor unions have little influence on shifts in the demand curve due to these factors.)

e. "Unions can increase wage levels and employment." To what extent is this claim true? (All other things equal, the extent to which unions can increase wage levels and employment, depends on the type of labor market. In bargaining for wages, labor unions would have more success in monopsonistic labor markets, because they are able to increase wages and employment opportunities. They are least successful in competitive markets, where a union may bargain for a wage rate above equilibrium, causing some unemployment. Yet unions that attempt to increase the overall demand for labor by promoting increases in productivity of their members may positively influence wages and employment.)

f. "Labor unions can cause unemployment in the labor market." To what extent is this claim true? (The labor union might cause some unemployment if it negotiates a wage rate above the competitive wage equilibrium.)

ACTIVITY 55 **ANSWER KEY**
How Wages Are Determined in Competitive Labor Markets

Wages and Labor



Use the graph *Wages and Labor,* which shows the supply and demand curves for a perfectly competitive labor market, to answer the questions that follow.

1. What are two factors that affect the demand for labor?
   Price of the product produced by that labor and the productivity of the labor.

2. How does marginal revenue product affect the demand for labor?
   A firm will hire labor until the wage = MRP. The perfectly competitive firm cannot control the wage so where wage = MRP the amount of labor demanded is determined. The MRP is the demand curve for labor.

3. Why is the demand curve for labor downsloping?
   Because under perfect competition the product price is constant, diminishing marginal productivity is the reason the demand curve is downsloping.

4. What determines the supply of labor?
   The number of people willing and able to work at various wages.

5. Why is the supply curve for labor upsloping?
   More people are willing to work if they are paid more.

6. What is the equilibrium wage in this labor market? **$3**

ACTIVITY 55 ANSWER KEY continued

7. How many workers will be hired in this labor market? **500**

8. If a minimum wage law raises the minimum wage to $4.50 an hour, what will be the quantity of labor supplied? **800**

9. At a minimum wage of $4.50 an hour, what will be the quantity of labor demanded? **300**

10. How many workers would be laid off or would lose their jobs because of this minimum wage? **200 (500 – 300 = 200)**

11. How many workers entered the labor force seeking a job because of this minimum wage? **300 (800 – 500 = 300)**

12. If the demand for labor were more inelastic, would more or fewer workers lose their jobs because of this minimum wage? ***Fewer.*** **The more inelastic the demand for labor, the smaller the number of people unemployed because of the minimum wage.**

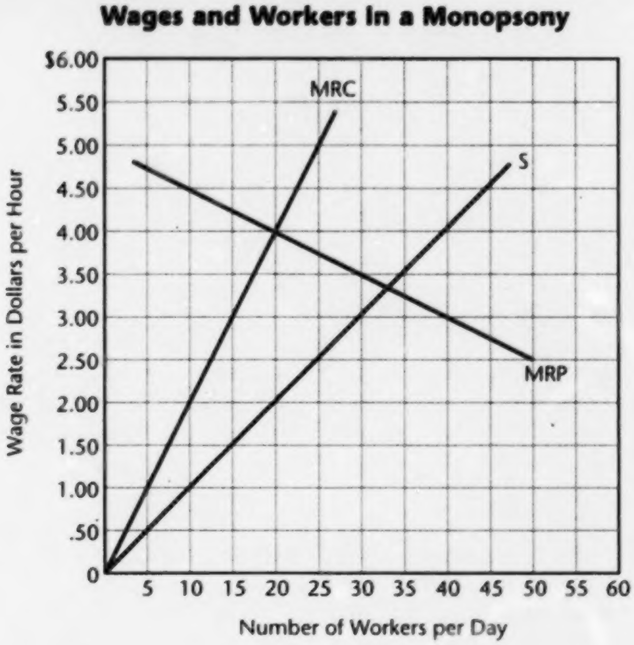
13. Would skilled or unskilled workers be more likely to lose their jobs because of a minimum wage law? ***Unskilled workers.*** **The market wage for skilled labor will usually be higher than the minimum wage while the market wage for unskilled labor will be below the minimum wage. Also, the demand curve for unskilled labor will be more elastic than the demand curve for skilled labor because for unskilled labor there is more substitutability.**

14. Who benefits from the minimum wage? ***Skilled workers and unskilled workers who keep their jobs.***

15. Who is hurt by the minimum wage? ***Unskilled workers who lose their jobs.***

16. Do you favor a higher minimum wage? __________
Why or why not? **Answers will vary. Although the minimum wage does lead to higher wages for those unskilled workers who keep their jobs, it hurts unskilled workers who lose their jobs. The least skilled and youngest workers are hurt most. Victims of discrimination are also hurt by minimum wage laws because a large pool of unskilled workers allows employers to pick and choose among the available job hunters.**

ACTIVITY 56 **ANSWER KEY**
How Wages Are Determined in Monopsonistic Labor Markets



Use the graph *Wages and Workers in a Monopsony*, which represents a monopsonist selling its product in a competitive product market, to answer the following questions. Fill in the answers or cross out the incorrect words in parentheses.

1. What is another name for the marginal revenue product (MRP) curve?
   The demand for labor.

2. Why is the MRP curve downsloping?
   Because this monopsonist sells in a perfectly competitive labor market, the sole reason the MRP curve is downsloping is the diminishing marginal productivity of labor.

3. Why is the supply curve for labor of the monopsonist upsloping?
   More workers are willing and able to work at higher wages.
   The benefits of working are greater at higher wages.

ACTIVITY 56 ANSWER KEY continued

4. Why is the marginal resource cost (MRC) for a monopsonist greater than the supply curve of a monopsonist?
A monopsonist is a wage seeker. It can set whatever wage it wants, but this decision has complications. Increasing wages to attract more workers means that it would raise the wages of the workers already hired at a lower wage rate. If this is not done, current workers will be upset, and the lower morale will decrease their productivity.

5. If this firm were in a competitive labor market:
   a. What would be the equilibrium wage? **About $3.40**
   b. What would be the number of workers employed? **33 workers hired per day**

6. Given the monopsonistic conditions of the *Wages and Workers in a Monopsony* graph, what are the wage and number of workers employed?
   a. Wage **$2.00**
   b. Number of workers employed **20 workers hired per day**

7. Compared to a firm operating in a competitive labor market, a market controlled by a monopsonist will pay a *(~~higher~~/lower)* wage rate and hire *(~~more~~/fewer)* workers.

8. Suppose the government passes a law mandating a minimum wage of $3 an hour. As a result, this monopsonist will *(increase/~~decrease~~)* its employment to **30** workers per day at a wage of **$3** per hour.

9. Would a minimum wage law increase or decrease employment in a monopsonistic labor market? **Increase** Why?
This assumes the minimum wage rate is above the equilibrium rate. The MRC curve becomes perfectly elastic at the minimum wage. This is also the supply curve. Employment will increase until the minimum wage equals $4.

10. Do you think labor markets are closer to monopsony or perfect competition? Support your answer.
Most labor markets are competitive but generally far from perfectly competitive. To help students see this, ask the career for which they are preparing, how many firms would be seeking employees with these skills, and how many people might have these skills.

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ACTIVITY 57 **ANSWER KEY**

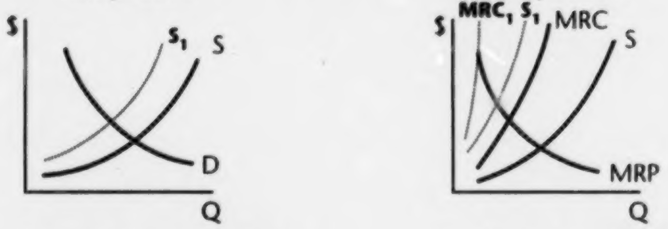
The Effects of Unions on Wages and Employment in Competitive and Monopsonistic Labor Markets

Assume two labor markets. Market 1 is competitive, and Market 2 is monopsonistic. Assume that each of the markets is in an initial equilibrium illustrated in each graph. Assume further that in each of the markets, a union is formed for each of the union goals.

- Illustrate on each graph the effects of the union goal.
- Identify the effects of the union goal on the wage rate and the number of workers employed. Explain the effects.

GOAL 1: The union is successful in requiring that teachers pass a state competency test in order to be employed.

Competency Test Required



Competitive

Wage Rate **Higher**

Employment **Lower**

Effects:
Fewer workers are hired at a higher wage because fewer people are willing and able to pass the required exam.

Monopsonistic

Wage Rate **Higher**

Employment **Lower**

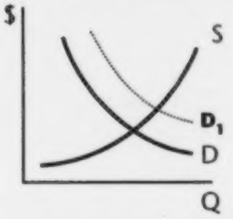
Effects:
Same as for competitive markets.

ACTIVITY 57 ANSWER KEY continued

GOAL 2: The labor union conducts a successful national advertising campaign urging people to buy union-made goods.

National Advertising Campaign

Competitive



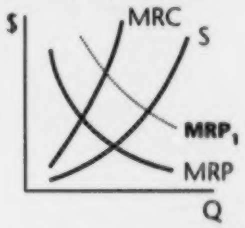
Wage Rate **Higher**

Employment **Higher**

Effects:

Greater sales increase MRP and therefore the demand for workers. The demand for labor is derived from the demand for the product.

Monopsonistic



Wage Rate **Higher**

Employment **Higher**

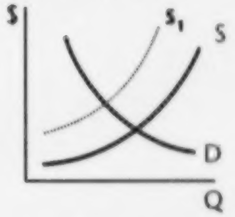
Effects:

Same as for competitive markets.

GOAL 3: The labor union requires state certification to practice in the state.

State-Certification Required

Competitive



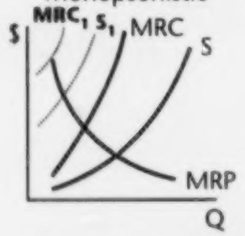
Wage Rate **Higher**

Employment **Lower**

Effects:

Supply decreases because certification removes some workers from the market.

Monopsonistic



Wage Rate **Higher**

Employment **Lower**

Effects:

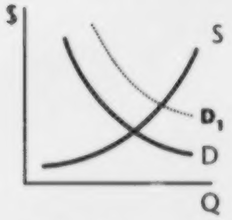
Same as for competitive markets.

ACTIVITY 57 ANSWER KEY continued

GOAL 4: The labor union educates workers in new methods of production, which leads to their increasing productivity.

Increased Productivity

Competitive



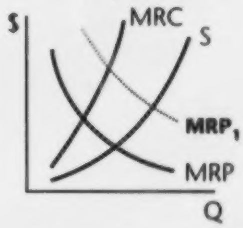
Wage Rate **Higher**

Employment **Higher**

Effects:

There is an increase in productivity, which increases MPP which would, all things equal, increase MRP or the demand for labor.

Monopsonistic



Wage Rate **Higher**

Employment **Higher**

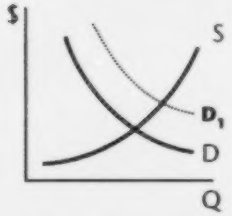
Effects:

Same as for competitive markets.

GOAL 5: The labor union promotes national legislation to increase quotas and/or tariffs on foreign competitors.

Quotas/Tariffs on Foreign Competition

Competitive



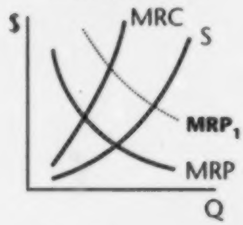
Wage Rate **Higher**

Employment **Higher**

Effects:

The net effect of tariffs and quotas is to increase the demand for and price of domestic goods. With an increase in price, MRP will increase, and therefore the demand for labor will increase. This means consumers pay more unlike the effects of goal 4, where productivity increases MPP, not prices.

Monopsonistic



Wage Rate **Higher**

Employment **Higher**

Effects:

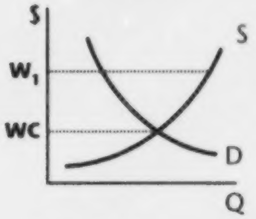
Same as for competitive markets.

ACTIVITY 57 ANSWER KEY continued

GOAL 6: The labor union bargains for and wins an increase in the wage rate above the equilibrium wage rate.

Wage Increase Above Equilibrium Rate

Competitive



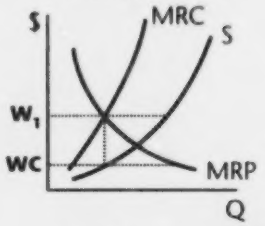
Wage Rate **Higher**

Employment **Lower**

Effects:

An increase in the wage rate would act as a price floor, increasing wages for some employees but reducing the number of workers employed.

Monopsonistic



Wage Rate **Higher**

Employment **Indeterminate**

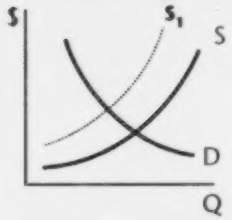
Effects:

Wages would increase, but the number of workers employed would be indeterminate depending on the level of the new wage. Up to the wage where MRC = MRP, employment would increase.

GOAL 7: The labor union signs an agreement with employers that forces them to hire only union members who have gone through the union's apprenticeship program.

Only Union Members Hired

Competitive



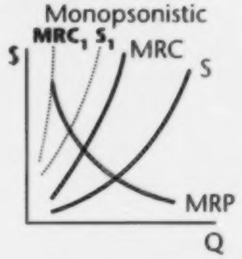
Wage Rate **Higher**

Employment **Lower**

Effects:

Supply would decrease. Demand could increase if the apprenticeship program increases productivity.

Monopsonistic



Wage Rate **Higher**

Employment **Lower**

Effects:

Same as for competitive markets.

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UNIT 4, LESSON 4

Rent, Interest, and Profits: The Returns for Land, Capital, and Entrepreneurship

Introduction and Description

The factor market questions on the AP test will place the heaviest emphasis on labor markets because labor accounts for almost 75 percent of payments to factors of production. However, there also may be questions on payments to other factors of production. Although rent is the smallest payment to any factor of production, the concept of economic rent provides insights into any input, like land, whose supply is fixed. Interest rates, determined by the supply of and demand for borrowed funds, are important influences on the ability of firms to raise funds for business investment. Economic profits create the energy in a capitalist economy and influence both resource utilization and the allocation of resources. Because the role of profits was analyzed in Unit 3, only one Activity on profits is provided in this lesson.

Objectives

1. Define *economic rent* and explain what determines the amount of economic rent paid.
2. Explain why the owners of land do not all receive the same amount of economic rent.
3. Apply the concept of economic rent (economic surplus) to the salaries of professional athletes.
4. Given the supply of and demand for money, determine the equilibrium rate of interest.
5. Distinguish between *nominal interest rate* and *real interest rate*.
6. Define *economic profit* and distinguish between *normal profit* and *economic profit*.
7. Analyze the functions of profit in a market economy.

Time Required

- Two and one-half class periods

Materials

1. Activities 58, 59, and 60
2. Visual 4.7

Procedure

1. Use Visual 4.7 to explain what determines economic rent. Ask questions such as these:
   a. Why is the supply curve for land vertical?
   b. What determines the amount of rent if the supply of land is perfectly inelastic (vertical)?
   c. What effect will an increase in the demand for land have on the amount of land available?
2. Explain the unique aspect of economic rent. Here is one approach to this explanation.

   The determination of rent, like wages, occurs within a context of supply and demand factors and institutional circumstances.

   Rent is usually accorded special treatment because of the inelasticity of the supply of land and other natural resources. This aspect of natural resources has attracted the attention of economists since the days of the Physiocrats and has led to controversial issues in economic theory and public policy (such as Henry George's single tax movement, urban renewal programs, "obscene profits" of landlords or the oil industry).

   The major theoretical point for students to understand is that when the supply of a factor is perfectly inelastic, the price paid to that factor cannot provide an incentive to produce more. Thus, economists refer to the returns to such a factor as a *surplus* or as *economic rent*.

   The amount of economic rent received by owners of land and other factors fixed in supply is determined by the productivity of each factor.

LESSON 4 continued

Henry George and others argued that, since a tax on land or any other factor with a fixed supply doesn't affect the amount of that factor available to society, all economic rent could be taxed away with no cost to society.

Critics of this theory point out that rent is a cost to individuals because the supply of land *for any one use* is not perfectly inelastic. Users of land, just as with other factors of production, must bid the land away from alternative uses. Thus, rent is merely a cost of production.

One approach to dealing with this topic is to do the following:

a. Make the definitions clear of the meanings of *fixed supply* and *economic surplus*.

b. Minimize the theoretical discussion, which can become extremely complex.

c. Focus on discussions of public policy questions that involve considerations of equity, efficiency, and attitudes toward wealth. For example, the following statements could be made topics for this discussion or debate:

> Agricultural land near a large city was selling for $3,000 an acre last year. Now a subdivision is being developed on this land, and it is selling for $50,000 an acre. Why did the price rise so dramatically? Do you think it's fair that the owners of this land reaped such a large and sudden return for no effort on their part?
>
> **(Some students will think that when an investor buys anything, he or she is taking a risk of a loss and a chance of a gain. If a purchase increases in value, the investor is entitled to benefit from that. Others will think that dumb luck should not be rewarded so generously. This is an example of a return that is a mixture of rent and profits—and possibly interest and wages.)**
>
> A professional basketball player earns $850,000 a year. The next best alternative for this player might be as a high school coach for $40,000 a year. Should $810,000 of his current salary be considered wages or rent (an economic surplus)? If a large part of the wages and salaries of many highly paid athletes, entertainers, and others is considered as economic-surplus payments (not necessary to attract people into a particular line of work), does this suggest that such incomes should be taxed heavily?
>
> **(Again, answers will vary. The major point is probably not whether answers are yes or no but whether economic reasoning is used in reaching a conclusion.)**

3. Assign Activity 58.
4. Discuss the answers to Activity 58.
5. Discuss the role of interest rates in a market economy. Make these points:
   a. The interest rate is the price paid for the use of money (loanable funds).
   b. Like other prices, the price of money (an interest rate) is determined by the supply of and demand for loanable funds.
   c. A real interest rate is the nominal rate of interest minus inflation.
   d. Real interest rates influence investment decisions.
6. Have the students complete Activity 59. Provide the clues for questions 1-5 in your discussion prior to assigning Activity 59.
7. Discuss the answers to Activity 59.
8. Discuss the role of profits in a market economy.
9. Assign Activity 60.
10. Discuss the answers to Activity 60.

ACTIVITY 58 **ANSWER KEY**

What Do Land, Athletics, and Government Have in Common? The Story of Economic Rent

Part A.

1. Assume that the quantity of a certain type of land available is 300,000 acres and the demand for this land is that given in the table *Demand for Land at Varying Prices.*

Demand for Land at Varying Prices

Pure land rent, per acre	Land demanded, acres
$350	100,000
300	200,000
250	300,000
200	400,000
150	500,000
100	600,000
50	700,000

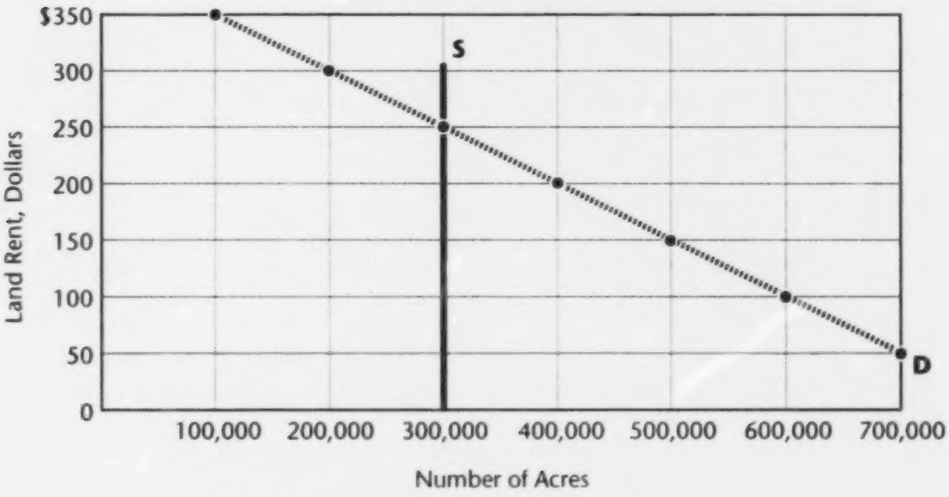
a. On the graph *Plotting Demand Curves for Land,* plot the supply and demand curves for this land and indicate the pure rent for land and the quantity of land rented.

b. The pure rent on this land will be $ **250** .

c. The total quantity of land rented will be **300,000** acres.

d. If landowners were taxed at a rate of $250/acre for their land, the pure rent on this land after taxes would be $ **0** but the number of acres rented would be **300,000** .

Plotting Demand Curves for Land



2. The table *Yield per Acre on Three Grades of Land* gives the yields (i.e., output per acre) in bushels on three grades of land resulting from varied amounts of expenditure on

ACTIVITY 58 ANSWER KEY continued

workers, fertilizer, etc. (Use only these data; don't try to estimate what would happen if other amounts are expended.) To answer the questions below, apply your marginal analysis skills to the data in the table.

Yield per Acre on Three Grades of Land

	Expenditure Per Acre						
Land Quality	0	$100	$200	$300	$400	$500	$600
Grade A land:	0	175	325	450	525	575	615
Grade B land:	0	160	290	375	445	490	525
Grade C land:	0	120	210	290	330	360	385

a. If the product sells for $1.00 a bushel, how many dollars per acre should be spent on:
Grade A land? **$300** Grade B land? **$200** Grade C land? **$100**

b. In a competitive market, what do you think the rental price would be for an acre of:
Grade A land? **$150** Grade B land? **$90** Grade C land? **$20**

(**Note:** Economic rent is defined as a return over and above opportunity cost or the "normal" return necessary to keep a resource in its current use. Using this logic, you can approach question 2b by asking: "What is the most someone would be willing to pay for the right to use an acre of each type of land?")

Part B.

Land is not the only resource whose supply is fixed. For example, the supply of some star athletes is fixed, at least in the short run. Hakeem Olajuwon, star center of the Houston Rockets, was the most valuable player in the National Basketball Association (NBA) in 1994. There is only one "Hakeem the Dream." Let's say he earns $6 million a year. Economic rent is any payment made to a resource above the amount necessary to induce any amount of the resource to be employed. Economic rent can also be defined as the amount over and above the opportunity cost necessary to keep the resource in its current use.

1. Assume that Olajuwon's next best option after playing basketball is to work as a high school teacher and coach. He could earn $40,000 a year in this job. How much economic rent is involved in Olajuwon's salary? **$5,960,000**

2. Now assume that someone else is as good at soccer as Olajuwon is at basketball. If that person wanted to play soccer in the United States, would he receive more or less economic rent than Olajuwon does for playing basketball? Support your answer. **Less because professional soccer is not as popular as basketball in the United States.**

ACTIVITY 58 ANSWER KEY continued

3. Now assume that the NBA is successful in passing a rule that requires a player to play for the same team for his entire career.
   a. What will happen to Olajuwon's salary? **It will be less**
   b. Will there still be economic rent? **yes**
   c. If there is economic rent, who will receive it and why?
   The owner will receive more economic rent, and Hakeem will receive less. This is because Olajuwon could not offer his services to other teams.

Part C.

The concept of economic rent also is used to explain the behavior of business executives, lawyers, and lobbyists in pursuing government contracts. For example, if a firm received an exclusive monopoly cable-TV contract for a city, it could charge more than the competitive price and receive economic rent. Therefore, firms will fight over this economic rent. To be successful, a firm may hire lobbyists or even offer bribes. This is wasteful behavior because valuable time used to get the contract could be used in producing goods and services. Economists believe that these activities will be undertaken until the cost equals the economic rent.

1. A city is offering a cable-TV contract for 20 years. The potential revenues from this exclusive franchise are $900 million. The costs including a normal profit are $500 million. How much economic rent is involved in this contract? **$400,000,000**

2. What is the maximum amount that will be wasted gaining the contract? **$400,000,000**

3. If city officials want the economic rent to go to the residents of the city, what steps should they take in awarding the contract? **Put the contract up for bid, establishing a competitive market price.**

ACTIVITY 59 **ANSWER KEY**
The Determination of Interest Rates and Their Effect on Investment Decisions

Part A.

Fill in the answer blanks or cross out the incorrect words in parentheses.

1. a. Interest is the price paid for the use of **money or loanable funds** .
   b. Interest is typically stated as a **percentage** of the amount of money borrowed.

2. Money or financial capital is obtained in the loanable funds market.
   a. The equilibrium rate of interest is determined by the intersection of the **demand** curve and the **supply** curve for loanable funds.
   b. The quantity demanded for loanable funds is *(~~greater than~~/~~less than~~/equal to)* the quantity supplied at the equilibrium rate of interest.

3. a. The quantity supplied of loanable funds is *(~~inversely~~/directly)* related to the interest rate.
   b. In this case, the higher the interest rate, the *(more/~~fewer~~)* funds households are willing to save and make available for loans.

4. a. The quantity demanded of loanable funds is *(inversely/~~directly~~)* related to the interest rate.
   b. In this case, the higher the interest rate, the *(~~more~~/less)* the quantity demanded for loanable funds because there are **fewer** opportunities for profitable investment.
   c. An investment is considered profitable if the **rate of return** is greater than the interest rate.

5. The interest rate performs two important functions. It helps determine how much **investment** will occur in the economy and then **allocates** it among various firms and industries.

Part B.

The *Schedule of Interest Rates* shows interest rates (column 1), the associated quantity demanded of loanable funds (column 2), and the quantity supplied of loanable funds (column 4) in billions of dollars at those interest rates.

Schedule of Interest Rates

Interest Rate	Quantity Demanded		Quantity Supplied	
(1)	(2)	(3)	(4)	(5)
12%	50	**120**	260	**400**
10%	100	**170**	240	**380**
8%	150	**220**	220	**360**
6%	200	**270**	200	**340**
4%	250	**320**	180	**320**
2%	300	**370**	160	**300**

ACTIVITY 59 ANSWER KEY continued

1. Plot the demand and supply schedules on the graph *Loanable Funds—Demand and Supply*. The interest rate is measured on the vertical axis and the quantity demanded or supplied is measured on the horizontal axis.

2. a. The equilibrium interest rate is **6%** .

   b. The quantity demanded is **$200** billion and the quantity supplied is **$200** billion.

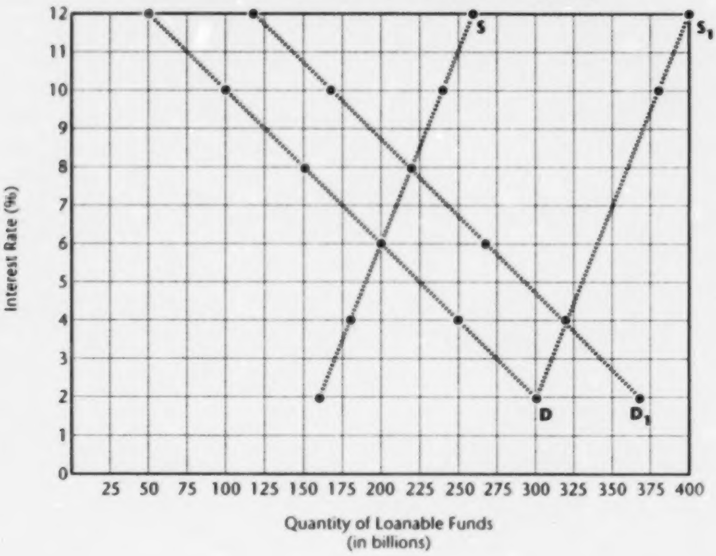
3. a. At an interest rate of ten percent, the quantity demanded of loanable funds is **$100** billion and the quantity supplied of loanable funds is **$240** billion.

   b. There is an excess of loanable funds of **$140** billion.

4. a. At an interest rate of four percent, the quantity demanded of loanable funds is **$250** billion and the quantity supplied of loanable funds is **$180** .

   b. There is a shortage of loanable funds of **$70** billion.

Loanable Funds–Demand and Supply



ACTIVITY 59 ANSWER KEY continued

5. If GDP increases and the demand for loanable funds increases by $70 billion at each interest rate, then the new equilibrium interest rate will be **8** percent and the equilibrium quantity of loanable funds will be **$220** billion. Fill in the new demand schedule in column 3 of the table *Schedule of Interest Rates* and plot this new demand curve on the graph *Loanable Funds—Demand and Supply*.

6. Then, because of changes in tax laws, households become more thrifty by $140 billion at each interest rate. The new equilibrium interest rate will be **4%** and the equilibrium quantity of loanable funds will be **$320** billion. Fill in the new supply schedule in column 5 of the table and plot this new supply curve on the graph.

7. Now it is time to distinguish between nominal and real interest rates. A nominal interest rate is uncorrected for inflation and is the interest rate normally quoted in newspapers. A real interest rate is the nominal interest rate minus the rate of inflation. It is real interest rates—not nominal interest rates—that affect investment decisions.

   a. If the nominal interest rate is nine percent and the rate of inflation is five percent, the real interest rate is **4** percent.

   b. True, false, or uncertain, and why? "The lowest real interest rate possible is a rate of zero percent."
   ***False*. If the inflation rate is higher than the nominal interest rate, the real interest rate could be negative.**

ACTIVITY 60 **ANSWER KEY**
Super Profits

1. Why does the fact that Mammoth Oil makes six cents a gallon on its gasoline not mean much?
   Sales reflect inventory rather than investment.

2. What is the best measure of profits?
   Stating profits as a percentage of shareholders' equity (investment) allows one to compare profits to the average rate of return on investment.

3. What would happen if firms in an industry were earning a greater than average return on investment?
   More firms will enter the industry; the price of the product will decline; and economic profits will decline. Firms will earn a normal profit.

4. What would happen if firms in an industry were earning a less than average return on investment?
   Firms will leave the industry; price will increase; and remaining firms will earn a normal profit.

5. What would happen if the government passed a law that would tax 100 percent of profits if the return on investment was over five percent?
   There would be few incentives for firms to follow consumer demand. The incentive of profits would be removed, and the market would no longer be efficient.

6. What is the function of profits in a market economy?
   Profits direct resources. Normal profits do not cause an expansion of resources devoted to the industry or an exit of resources from the industry. Economic profits, sometimes called excess profits, will attract resources to the industry but will be eliminated in the long run. Profits that are lower than normal will cause resources to leave the industry.

UNIT 4, LESSON 5

Analyzing Factor Market Concepts

Introduction and Description

This lesson helps students apply their knowledge of factor markets to conventional and unconventional situations. Activity 61 can be assigned as homework or completed in groups. It is good practice for the complex application questions that are emphasized on the AP test.

Objective

Use factor market concepts to analyze a variety of issues.

Time Required

- One class period

Materials

Activity 61

Procedure

1. Assign Activity 61 a few days before it is due or have the students complete it in groups.
2. Discuss the answers to Activity 61.

ACTIVITY 61 **ANSWER KEY**
Problems on Factor Markets

Part A.

Answer the questions and briefly explain your answers. Feel free to use diagrams to illustrate your points.

1. True, false, or uncertain, and why? "Basketball players are paid more than brain surgeons. This makes no economic sense."
   False. **A professional basketball team will pay for a player until MRP = the wage. A star player can generate a lot of extra revenue for a team.**

2. True, false, or uncertain, and why? "If it were not for unions pushing up wages, we'd all be working 60 hours a week for $100 a month just like people did a century ago."
   False. **Although unions may raise the wages of their members, the biggest factor in increasing real wages is higher productivity. Increases in real wages depend on increases in real output.**

3. Firms that want to maximize their profits use a resource until the marginal revenue product of that resource equals the marginal resource cost. Why?
   If MRP is greater than MRC, the firm will improve its profits by hiring the resource. If MRP is less than MRC, the firm will be losing money by hiring the extra resource. The firm will maximize profits where MRP = MRC. This logic is the same as for the product market where a firm maximizes profit where MR = MC.

4. True, false, or uncertain, and why? "American workers who are paid $10 an hour cannot possibly compete with workers who are paid $1 an hour in developing countries."
   False, **or we would be buying all our goods from third-world countries. Americans are paid more because their productivity is higher. Increases in real wages depend on increases in real output.**

5. Some universities pay their football or basketball coaches more than their presidents. Does this make sense economically? Support your answer.
   Yes. **A good team can generate millions of dollars in extra revenue. Therefore, successful coaches are paid a lot.**

6. What are the effects of a minimum wage that is above the equilibrium wage in a perfectly competitive market? In a market in which the employer is a monopsonist? Do you believe the labor markets are closer to perfect competition or to monopsony? Justify your answer.
   In a competitive market, a minimum wage increases the number of workers who want to work (quantity supplied) and decreases the amount of workers employers want to employ (quantity demanded). Greater unemployment results. For a monopsonist, MRC is above the supply curve for labor, and this results in a lower wage and lower output than if the firm were a perfect competitor in the labor market. Raising the minimum wage will increase employment and wages until the wage becomes greater than the point where MRC = MRP. Most economists believe labor markets are closer to perfect competition than to monopsony.

ACTIVITY 61 ANSWER KEY continued

7. The National Collegiate Athletic Association (NCAA) regulates all college athletics in the United States. It sets the amount of scholarships, the number of scholarships granted, and the regulations for recruiting athletes. The NCAA has hundreds of rules regulating intercollegiate athletics.

   a. What effect do these regulations have on who receives the economic rent from college athletics?
   They set the level of the athletes' benefits and salaries so the universities receive the economic rent.

   b. Which colleges have greater incentives to cheat? Why?
   Colleges that do not have national academic prestige and cannot recruit against the colleges that do. Colleges with big arenas and stadiums that they need to fill. A star athlete can increase MRP a lot.

   c. Who would gain if the NCAA could no longer set rules for college athletics? Why?
   Probably the athletes who would receive higher salaries and not just standard scholarships. Players in major-revenue sports would be helped, and players in low-revenue sports would be hurt.

   d. Who would lose if the NCAA could no longer control college athletics? Why?
   The universities that would have to pay a wage determined by supply and demand.

   e. True, false, or uncertain, and why? "The NCAA is a champion for amateur athletics, and its rules protect the rights of college athletes."
   ***False* or *uncertain*. The NCAA does champion the cause of amateur athletics, but this may benefit the universities more than the athletes. A case can be made that the NCAA is a champion for the majority of amateur athletes, who are not in major revenue sports.**

ACTIVITY 61 ANSWER KEY continued

Part B.

In the table *Firm Operating in a Competitive Market* you are given information about a firm operating in a competitive market. Consider all factors of production fixed, with the exception of labor. The other factors of production cost the firm $50 per day, which may be thought of as a fixed cost. Assume the firm is a profit maximizer.

Firm Operating in a Competitive Market

Labor input (workers per day)	Total physical product (units per day)	Marginal physical product (units per day)	Marginal revenue product ($ per worker)
0	0		
		22	**66**
1	22		
		18	**54**
2	40		
		16	**48**
3	56		
		14	**42**
4	70		
		12	**36**
5	82		
		10	**30**
6	92		
		8	**24**
7	100		
		6	**18**
8	106		

Fill in the answer blanks or cross out the incorrect words in parentheses.

1. a. Assume that the firm sells its output at $3 per unit. Complete the last two columns in the table. **(See above.)**

   b. If the going market wage is $36 per day, the firm will hire **5** workers per day and produce **82** units of output.

   c. Given your answer to the preceding question, the firm will have total revenues of **$246 (82 x $3 = $246)** per day and total costs of **$230 (5 x $36 = $180 +$50 = $230)** per day.

   d. The above will result in a *(profit/~~loss~~)* of **$16** per day.

2. Suppose you work for a firm that sells its output in a monopoly market. Answer the following questions.

   a. If you hire an additional worker, output goes up by 50 units to 125 units per day. If you wish to sell the additional 50 units, you must lower your price from $3 per unit to $2 per unit. What is the maximum wage you would be willing to pay the additional worker?

   75 x $3 = $225 MRP $25

   125 x $2 = $250
   $25 is the maximum wage you will pay.

ACTIVITY 61 ANSWER KEY continued

b. Assume that you hired the additional worker and output now stands at 125 units per day. If another worker is hired, output rises to 165 units per day. Given the demand curve for your product, you know that in order to sell the additional output, price will have to be dropped from $2 per unit to $1 per unit. What is the maximum wage you would be willing to pay *this* additional worker?
125 x 2 = 250
165 x 1 = 165
You would not pay the extra worker a wage because MRP is negative.

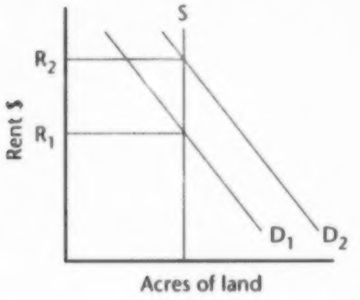
3. True, false, or uncertain, and why? "Monopsonists will always hire fewer workers and pay lower wages than firms operating in competitive labor markets." (Assume that the monopsonistic and competitive firms have the same costs.)
***True*. The reason is that if the monopsonist increases the wage of the last worker, it must increase the wage of all previous workers. Therefore, MRC is above supply at each amount of labor. The monopsonist operates where MRC = MRP (demand). This is at a lower output and lower wage than a competitive firm would charge.**

Answers to Sample Multiple-Choice Questions

1. a
2. e
3. d
4. d
5. a
6. e
7. e
8. a
9. e
10. d
11. c
12. c
13. b
14. c
15. e
16. a
17. b
18. c
19. c
20. b
21. b
22. e
23. b
24. c
25. b

Answers to Sample Short Essay Questions

1. The demand for resources is derived from the demand for a good or service that is produced with that resource. The demand for resources is affected by the price of the good or service and the marginal productivity of labor. Because the marginal productivity decreases as output increases, marginal revenue product decreases. MRP is the demand for the resource. In addition, if the firm is operating in an imperfect product market, the price of the product will decrease as output decreases. This also decreases MRP.
2. Students may use several examples, which should relate to these categories:
   a. The demand for and therefore the price of the product produced by that resource increases.
   b. The productivity of that resource increases.
   c. The price of a substitute resource decreases as long as the output effect is greater than the substitution effect.
   d. The price of a substitute resource increases as long as the substitution effect is greater than the output effect.
   e. The price of a complementary resource decreases.
3. It will increase wages and employment up to the point where MRC = MRP. This is because for a monopsonist MRC is greater than supply.
4. The monopsonist will hire fewer workers and pay a lower wage.
5. The elasticity of demand for a resource is affected by the rate of decline of the marginal physical product, the ease of resource substitutability, and the elasticity of demand for the product. The slower the decrease in marginal physical product, the greater the number of substitutes for the resource, and the greater the elasticity of demand for the product produced with the resource, the greater will be the elasticity of demand for the resource.
6. Money (nominal) wages are the actual amount of money the worker receives. Real wages, however, reflect the amount of goods and services the worker can buy with those wages. Real wages are nominal wages adjusted for inflation. For example, if the rate of inflation were six percent and a worker's nominal wages increased eight percent, the increase in real wages would be two percent.
7.



Economic rent is the price paid for the use of land and other natural resources that are completely fixed in supply. Therefore, the demand for the fixed land determines its rent. As demand increases from D_1 to D_2 the amount of rent increases from R_1 to R_2.

Answers to Sample Long Essay Questions

1. Point Assessment: Basically the point distribution is three points for part a.; three for part b.; one point for part c.; and two for part d.

Part a.: three points

The labor supply curve shifts to the right resulting in a decrease in the equilibrium wage. The supply curve shifts to the right because of the influx of workers. The decrease in wage rate reduces the costs of production for the firm using the labor, resulting in an increase in supply for the product...rightward shift of the product supply curve.

one point—An explanation that the labor supply curve shifts to the right (1/2 point) due to an influx of labor → wage rate declines (1/2 point).
one point—Firm's costs decline because wage rate declined.
one point—Show supply curve of product increases (1/2 point) and the equilibrium product price declines (1/2 point).

Part b.: three points

The demand for goods declines resulting in a product price decrease. The product price decline causes the MRP_L to decrease (shift to the left) because labor is a derived demand.

Wage rate declines.

one point—Product price declines with explanation/graph (1/2 point for price decrease, 1/2 point for decrease in demand).
one point—MRP_L declines. Must link product price decline to the decrease in demand for labor. (The use of the term derived demand or indicating product Q decreases → need for labor decreases is *inadequate*.) Grading here will be either zero or one.... that is, a half is *not* an option.
one point—Wage rate declines (1/2 point) as a result of decrease in the demand for labor (1/2 point).

Part c.: One point

The minimum wage must be set above the equilibrium wage rate.

Once again, either a zero or a one should be allocated....that is, a half is not an option.

Part d.: Two points

If the minimum wage is above the equilibrium wage then there will be a decrease in employment and the firm's costs of production will increase.

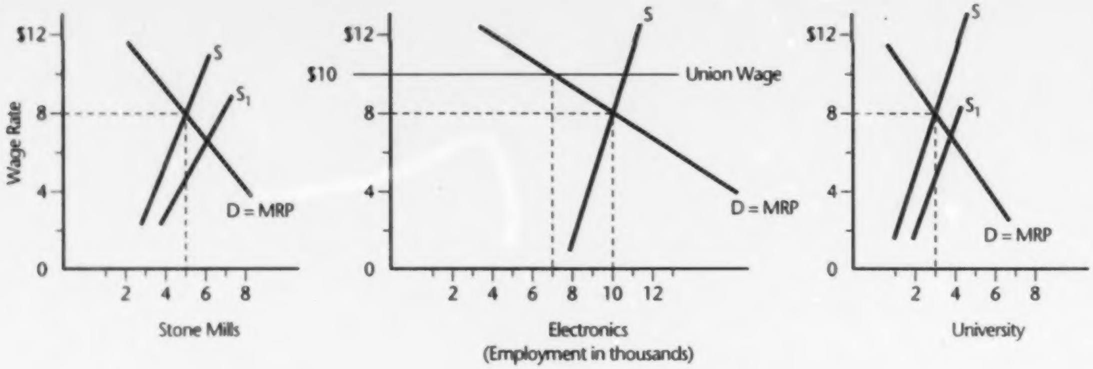
one point—Decrease in employment (1/2 point) and 1/2 point for explanation.
one point—Increase in costs of production.

Once again, point allocation will be either a zero or a one.
In part d. we are looking for a *consistent* answer with what they said in part c. Consistency is rewarded.

NOTE: May make efficiency wage argument—higher wage results in higher productivity, less turnover, greater "loyalty" to firm, etc. So....costs might not rise.

ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

2.



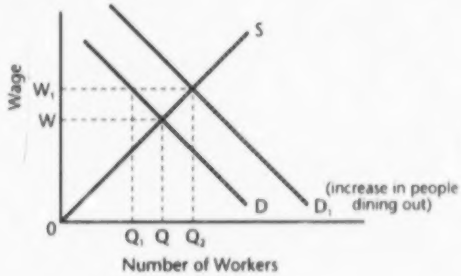
Note the graphs above. With no change in the basic underlying demand conditions or productivity of workers, employment at the **$10** wage in the electronics industry will be reduced by 2,000 workers who are willing to work at a wage of **$8**. These workers will show up at the stone mills and the university looking for work at $8. This increased supply of labor will put downward pressure on wages and tend to increase unemployment in these locations. (No exact numbers needed here—in the diagrams supply was increased at **$8** [and other wages] by 1,000 workers at both the stone mills and the university.)

Winners:
1. Electronics workers who are still employed at $10 and people who receive the extra income these electronics workers spend.
2. Stone mills and the university that gain as employers.

Losers:
1. People laid off at the electronics plant and stone mills and university employees who feel the effects that this cutback has in their consumption spending.
2. Purchasers of electronics products if the higher wage costs lead to higher product prices.

3.a. The beginning equilibrium wage rate and employment in a competitive factor market are illustrated as *W* and *Q*. A union that bargains for a wage rate above *W* creates a price floor, designated as W_1. Wages will increase for some union members but only at the cost of some union members losing their jobs ($Q - Q_1$). Restaurant owners will hire at MRC – MRP. In addition, the restaurant owners will not continue to hire at *Q* because at that employment level, MRC > MRP so fewer waiters will be employed.

b. The increase in the demand for dining could help alleviate some of the unemployment as a result of the increased wage rate. The demand for labor is derived from the MPP of labor and the product prices. Assuming the demand for dinners increased, the price of dinners would increase, depending on the change in demand. The net result is an increase in the demand for labor. If demand (MRP) shifts as illustrated, wages will be maintained at W_1 but more laborers would be employed as owners now will equate the change MRP = MRC. Overall, the effect of an increase in demand for dinners creates additional job opportunities for waitstaff.



Visual 4.1

Big Ideas about Factor or Resource Markets

1. The economic concepts are the same as for product markets.
2. The demand for a factor of production is derived from the demand for the good or service produced from that resource.
3. A firm tries to hire additional units of a resource up to the point where the resource's marginal revenue product (MRP) is equal to its marginal resource cost (MRC).
4. In hiring labor, a firm will do best if it hires up to the point where MRP = the wage rate. Wages are the marginal resource cost of labor.
5. If you want a high wage:
   a. Make something people will pay a lot for.
   b. Work for a highly productive firm.
6. Real wages depend on productivity.
7. Productivity depends on real capital, human capital, labor quality, and technology.

From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

Visual 4.2

Percentage Distribution of National Income–1992

Wages and Salaries	74.3%
Interest	8.8%
Corporate Profits	8.3%
Proprietors' Income	8.5%
Rental Income*	0.1%

*Not the same as pure economic rent, a concept discussed in this unit.

Source: *Statistical Abstract of the United States*, 1993, p. 453.
From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

Visual 4.3

The Demand for a Resource: Perfect Competition in the Sale of the Product (hypothetical data)

(1) Units of Resource	(2) Total Product	(3) Marginal Physical Product (MPP), or Δ(2)	(4) Product Price	(5) Total Revenue, or (2) x (4)	(6) Marginal Revenue Product (MRP), or Δ(5)
0	0		$2	$0	
		7			$14
1	7		2	14	
		6			12
2	13		2	26	
		5			10
3	18		2	36	
		4			8
4	22		2	44	
		3			6
5	25		2	50	
		2			4
6	27		2	54	
		1			2
7	28		2	56	

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Visual 4.4

The Demand for a Resource: Imperfect Competition in the Sale of the Product (hypothetical data)

(1) Units of Resource	(2) Total Product	(3) Marginal Physical Product (MPP), or Δ(2)	(4) Product Price	(5) Total Revenue, or (2) x (4)	(6) Marginal Revenue Product (MRP), or Δ(5)
0	0		$2.80	$ 0	
		7			$18.20
1	7		2.60	18.20	
		6			13.00
2	13		2.40	31.20	
		5			8.40
3	18		2.20	39.60	
		4			4.40
4	22		2.00	44.00	
		3			2.25
5	25		1.85	46.25	
		2			1.00
6	27		1.75	47.25	
		1			–1.05
7	28		1.65	46.20	

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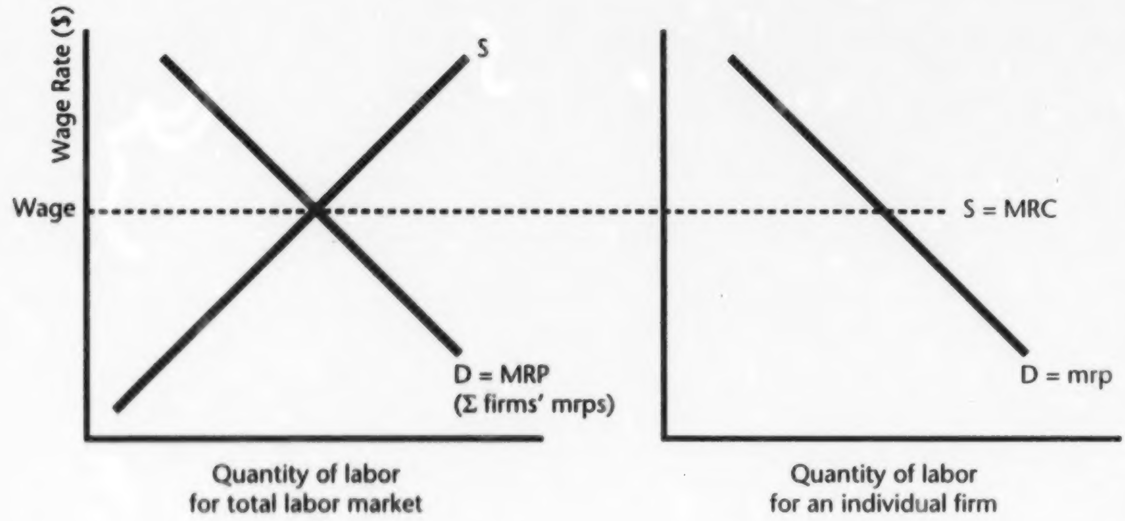
Visual 4.5

The Supply of and Demand for Labor in a Competitive Labor Market



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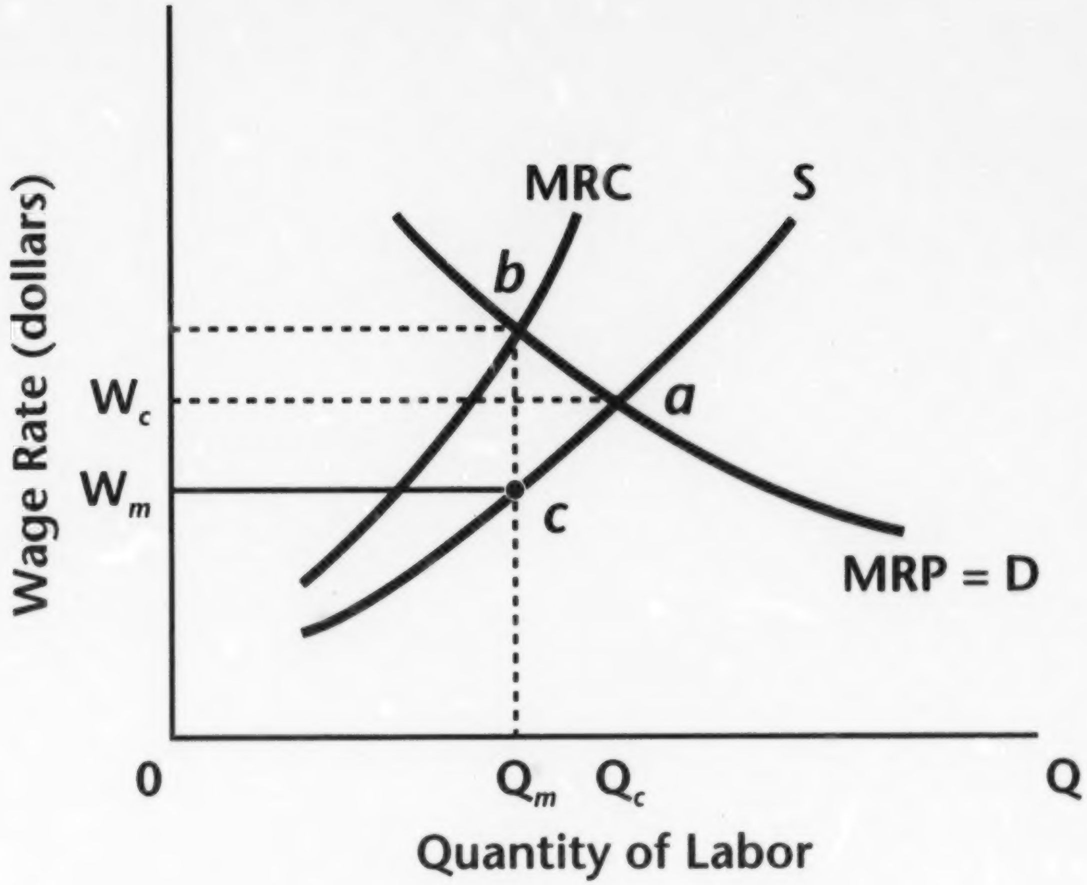
Visual 4.6

The Wage Rate and Level of Employment in a Monopsonistic Labor Market



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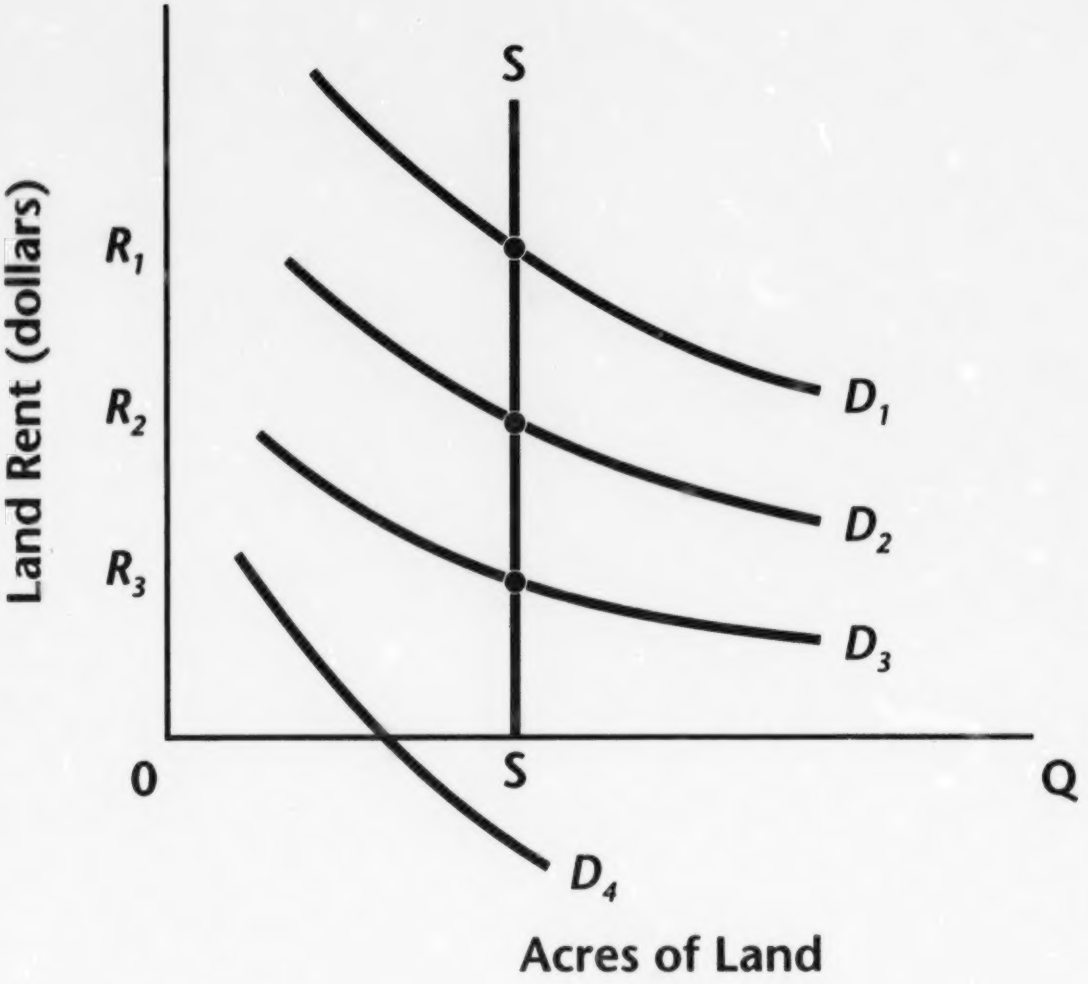
Visual 4.7

The Determination of Economic Rent



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Microeconomics

Unit 5

The Role of Government

12 Days

Unit Overview

In this unit, students should develop criteria to determine which activities government should undertake and to evaluate how well government performs.

Activities 62 and 63 define and provide examples of public goods. Activities 64 through 66 deal with market failures and illustrate how government can correct them. In Activities 67 through 69, students study environmental economics. They not only learn why government must intervene in the market to clean up pollution but why many government environmental programs have been ineffective. Activities 70 and 71 cover public-choice economics. Government may correct market failures, but there are economic reasons that indicate why government itself can be ineffective. Finally, Activities 72 and 73 deal with the economics of taxation.

Approximately 12 percent of the AP exam will cover the role of government, with an emphasis on public goods, externalities, and the effects of tax policies.

Textbook Assignments

Baumol and Blinder, Chapters 13, 20, and 21

McConnell and Brue, Chapters 6, 31, and 32

Miller, Chapters 8, 27, and 32

Planning Ahead

The lessons in this unit concern externalities, the definition of a public good, tax equity, and tax incidence. To make the unit lively and relevant, students should also study the current spending and taxing decisions of their federal, state, and local governments. Government budgets are covered in newspapers.

This edition of the **Advanced Placement Economics** program adds public-choice economics to the unit. McConnell/Brue and Miller have chapters on public-choice economics while Baumol/Blinder does not. Although public-choice theory has not yet been tested on the AP exam, it is becoming an important part of a public finance unit.

Unit 5 Activities

Activity 62	Private or Public? Public Goods and Services
Activity 63	Private versus Public
Activity 64	Third-Party Costs and Benefits
Activity 65	Externalities Worksheet
Activity 66	What Would You Do?
Activity 67	Economic Efficiency and the Optimum Amount of Pollution Cleanup
Activity 68	Free-Market Environmentalism
Activity 69	Paying to Use a Scarce Resource: Carbon and Sulfur Taxes
Activity 70	Public-Choice Economics
Activity 71	Solving the Mysteries of Government
Activity 72	What Is a Fair Tax?
Activity 73	Excise Taxes

Visuals

Visual 5.1	The Economic Functions of Government
Visual 5.2	Illustrating a Negative Externality
Visual 5.3	Illustrating a Positive Externality
Visual 5.4	Public-Choice Economics or Why Cats Don't Bark
Visual 5.5	Tax Incidence and Elasticity and Demand

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Sample Unit 5 Plan

Week 1	**Week 2**	**Week 3**
1. Have students brainstorm on the functions of government. 2. Lecture on functions of government, using Visual 5.1. 3. Discuss public goods. 4. Have students do Activity 62. 5. Assign Baumol, Chap. 13; McConnell, Chap. 6; Miller, Chap. 5.	1. Have students read Activity 69 and introduce the answers 2. Assign McConnell, Chap. 32; Miller, Chap. 27.	Review using sample Multiple-Choice and Essay Questions.
1. Complete Activity 63. 2. Have student read Activity 64. 3. Use Visuals 5.2 and 5.3 to discuss externalities. 4. Assign Activity 65.	1. Introduce public-choice theory. 2. Use Visual 5.4 to discuss basic ideas on public-choice theory. 3. Assign Activity 70.	Unit Test.
1. Go over Activity 65. 2. Complete Activity 66. 3. Assign Baumol, Chap. 21; McConnell, Chap. 31; Miller, Chap. 32.	1. Discuss the answers to Activity 70. 2. Have students do Activity 71 in small groups. 3. Assign Baumol, Chap. 20.	
1. Have students do Activity 67. 2. Go over Activity 67. 3. Assign Activity 68.	1. Lecture on the ability-to-pay and benefits-received theories of taxation. 2. Discuss progressive, proportional, and regressive taxes. 3. Have students complete Activity 72. 4. Discuss the answers to Activity 72.	
Go over Activity 68 and discuss market-based approaches to cleaning up the environment.	1. Lecture on tax incidence, using Visual 5.5. 2. Have students do Activity 73.	

UNIT 5, LESSON 1

The Economic Functions of Government

Introduction and Description

In the United States, most economic decisions are made in the marketplace through the interaction of buyers and sellers. Some goods and services, however, can be provided only by government. Students should know the criteria that should be used to judge whether a good or service should be provided by the private sector or by government. They must know the characteristics of public goods and private goods.

Objectives

1. Define *public good.*
2. Describe the characteristics of a public good.
3. Develop a rationale for determining which goods should be produced by the private sector and which by the public sector.

Time Required

- One and one-half class periods

Materials

1. Activities 62 and 63
2. Visual 5.1

Procedure

1. Ask the students to brainstorm on the jobs government does. Have them list as many functions of local, state, and federal government as they can.
2. Give a lecture on the economic role of government, using Visual 5.1.
3. Introduce the concept of a public good. Explain that a public good has both shared consumption and nonexclusion. You might ask the students to classify some goods using:
    a. Exclusion.
    b. Nonexclusion.
    c. Non-shared consumption (rival good).
    d. Shared consumption (non-rival good).

    Some possibilities are:

    a. Hamburger—exclusion and rival.
    b. TV show—exclusion but non-rival.
    c. Park—exclusion but non-rival.
    d. Education—exclusion but non-rival.
    e. National defense—nonexclusion and shared consumption (non-rival).
4. Discuss the problem of free riders when people cannot be excluded from using goods.
    a. Ask what happens if a person does not contribute to public television.
    b. Offer to sell a grade for the highest price. But once the first grade is sold, everyone in the class gets that same grade. Who will buy the grade? Will all the students join together to buy it? What if one student refuses to pay?
5. Have the students read Activity 62 and answer the questions.
6. Discuss the answers to Activity 62.
7. Have the students complete Activity 63 and discuss the answers. These are opinions, but goods produced by government should meet the criteria of nonexclusion and shared consumption.

ACTIVITY 62 **ANSWER KEY**
Private or Public?
Public Goods and Services

1. What is the difference between the private and public sectors of our economy?
The public sector is government—federal, state, and local. The private sector of our economy consists of decisions in the marketplace made between buyers and sellers.

2. What are the characteristics of a pure private good?
It is traded through voluntary exchange. People not part of the transaction can be excluded from the transaction. Pure private goods, like haircuts, cannot be characterized by shared consumption.

3. What are the characteristics of a pure public good?
Nonexclusion, Shared Consumption

4. Place each of the following into one of the four boxes in the chart *Determining Combinations of Exclusion and Shared Consumption.*
5. Circle the box that contains pure private goods. Then draw two circles around the box that contains pure public goods.

Determining Combinations of Exclusion and Shared Consumption

		Shared Consumption	
		No	*Yes*
Exclusion	*Yes*	b. Electric power c. A haircut h. Canine rabies shots n. Health care p. Potato chips q. Auto airbags	a. A college education e. A private amusement park j. The St. Lawrence Seaway g. Cable television l. Public tollroads and bridges o. National forest campgrounds
	No		d. National defense f. Spraying for mosquitoes i. Street lights m. Police and fire protection

ACTIVITY 62 ANSWER KEY continued

6. What is a "free rider"? Select three goods from the list in question 4 that could have free riders.
Someone who uses the good but doesn't pay for it. Free riders occur when there are nonexclusion and shared consumption.
Examples:
Spraying for mosquitoes
Police and fire protection
National defense
Street lights

7. Should health care or insurance for all be a public or a private good? What are the advantages and disadvantages of each?
Health insurance does not meet any of the criteria of a public good. People who don't buy it can be excluded from receiving the benefits. If one person receives a health-insurance dollar, no one else can receive it. The arguments for government-provided health care are that private health insurance is not fair because people are excluded and that government health insurance would be more efficient. Also, if people are not currently covered by health insurance, then there might be a positive externality if universal coverage lowers the amount of disease that is spread.

8. What does "privatization" mean? Give examples of goods that have been privatized. What else could be privatized?
The sale of a good or service provided by government to a private business.
Examples from Europe and Latin America:
    Steel mills
    Mines
    Banks
    Utilities
    Airlines
A good candidate for privatization is any good or service that is characterized by the ability to exclude people who do not pay for it. Education, prisons, garbage pickup, ambulance service, and government-owned utilities might be privatized.

UNIT 5, LESSON 2
When Markets Fail

Introduction and Description

Some government intervention in the economy is designed to remedy problems arising from third-party costs and benefits of private activities or transactions. Students who understand third-party effects—often called externalities—can analyze the need for and the effect of such government interventions.

Objectives

1. Explain how private market activities can cause externalities.
2. Define and give examples of *third-party costs* or *negative externalities*.
3. Define and give examples of *third-party benefits* or *positive externalities*.
4. Analyze ways positive and negative externalities can cause overproduction or underproduction of goods and services.
5. Analyze the effectiveness of government policies designed to remedy problems caused by positive or negative externalities.

Time Required

- One and one-half class periods

Materials

1. Activities 64, 65, and 66
2. Visuals 5.2 and 5.3

Procedure

1. Have students read Activity 64 and answer questions about the reading. (There is no answer key because it is replaced by the discussion.)
2. The reading concerns the external effects of production; you may want to bring up additional examples. In your explanations, you might emphasize the external effects of consumption to help students comprehend that consumers as well as producers are involved in the process of imposing external costs and benefits on others. Some examples follow:
    a. Smoking creates external costs. The smoker is satisfied, and the tobacco company gains, but third parties often have to cope with smell and litter as well as the hazard to health from breathing secondary smoke.
    b. People who drive under the influence of alcohol are much more likely to cause accidents than other drivers. These accidents cause third parties to suffer personal injury and/or property damage.
    c. The productive work of maintaining one's house is an example of an external benefit provided by a consumer who also acts as a producer. If people landscape their yards, paint, and otherwise maintain their houses, the whole neighborhood looks better. The houses are then usually worth more than houses in comparable neighborhoods in which the owners do not maintain their houses to an equal extent.
    d. Education provides third-party benefits. On the whole, people's productivity increases with their level of education. A higher level of education also tends to be correlated with better health and a lower crime rate. Third parties benefit from this greater productivity through fewer demands on health-care services and the lower burden on the police and judiciary.
    e. If you teach in a public school, ask students why the taxpayers should pay for their education. One reason is the third-party benefits created by education.
3. Using Visual 5.2, illustrate a negative externality and how it can be corrected.
4. Using Visual 5.3, illustrate a positive externality and how it can be corrected.
5. Have students answer the questions in Activity 65.
6. Discuss the answers to Activity 65.
7. Have the students read Activity 66.

LESSON 2 continued

8. Put the students in groups to discuss the proposals and have each group choose the best proposal for each case study. Tell them they will have to defend their choices.

9. Have each group report to the class and then discuss the various proposals. Here are some major points that should be made during the discussion:

    1. Pollution problem

       Proposal 1 places the entire burden of pollution control on the downstream residents. Yet the firm's pollution is interfering with their property rights. It is not fair that the downstream residents should pay this cost.

       Proposal 2 is naive. Closing the plant may stop the pollution, but it will also cost jobs and hurt the firm's customers. Too much of the product may be produced in an unregulated market, but that does not mean that none should be produced.

       Proposal 3 makes the most sense. The effluent tax forces both the business and its customers to share the cost of the pollution. The tax will increase production costs and price and cause less of the product to be produced. The economy will no longer be overproducing the product.

    2. Stadium problem

       Without more information, any of the following answers are justifiable.

       Proposal 1: There are no substantial external benefits. This is mainly a private transaction. Let those who want to see baseball pay for the stadium as part of the cost of the tickets. If taxes go up, purchases of various things go down.

       Proposal 2: The market for baseball games will impose external costs on residents in the stadium area and others who wish to drive and park there. Tax ticket sales to force the team and fans to bear part of the external costs, thus reducing overproduction of baseball.

       Proposal 3: There are significant external benefits. Without subsidization of baseball, it will be underproduced. Therefore, the residents should pay for some of the benefits through higher taxes.

ACTIVITY 65 **ANSWER KEY**
Externalities Worksheet

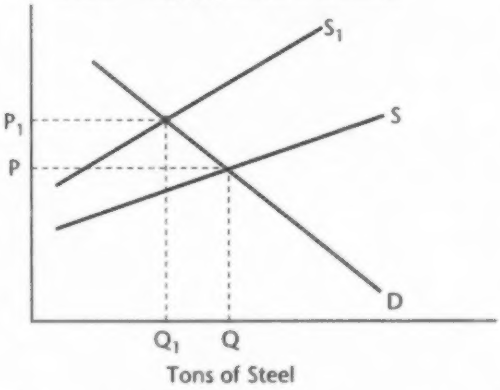
Part A. Third-party costs

1. Define negative externality or third-party cost.
   Part of the cost of a transaction or activity is borne by third parties, i.e., people not directly involved in the transaction.

2. Give three examples of third-party costs.
   Possible answers:
   - **pollution**
   - **harmful effects of pesticides**
   - **failure to maintain a home and the land belonging to it, which reduces the value of adjoining property**
   - **smoking**
   - **drinking and driving**
   - **and many others**

3. In the graph *Steel—Supply and Demand,* only the private costs and benefits have been illustrated. Draw the new supply curve, and show the new equilibrium price and quantity for steel if the external costs of pollution were also counted as costs of production.

Steel—Supply and Demand



4. Would more or less steel be produced according to the new supply curve? **Less**

5. Would the price be higher or lower? **Higher**

6. Why are products that entail third-party costs "over-produced"?
   Because the third-party costs are shifted to the community, supply is greater, and prices are therefore lower than if all costs were borne by those involved in the transaction.

ACTIVITY 65 ANSWER KEY continued

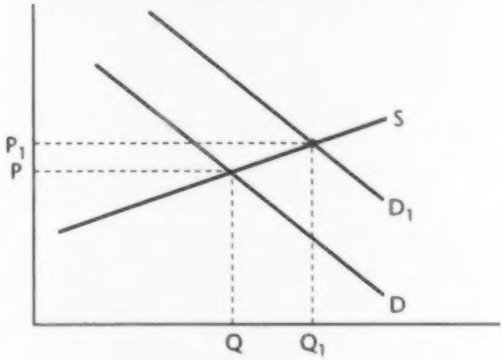
Part B. Third-party benefits

1. Define positive externality or third-party benefit.
   Part of the benefits of a transaction or activity is received by third parties, i.e., people not directly involved in the transaction.

2. Give three examples of third-party benefits.
   Possible answers:
   - **education**
   - **vaccination against disease**
   - **creating a park out of property that was previously a junkyard and thus improving the neighborhood for all**
   - **repairing a dilapidated house, which results in increasing the value of adjoining property**
   - **installing lighting in the front yard of a house**

3. In the graph *Education—Supply and Demand,* only the private costs and benefits have been illustrated. Change the graph to show the new demand curve for education if all the third-party benefits to the community were counted as part of demand. Show the new equilibrium price and quantity. **(Demand should increase or shift to the right.)**

Education—Supply and Demand



Tons of Steel

4. Would more or less education be produced according to the new supply curve?
   More

5. Would the price be higher or lower? **Higher**

6. Why may products that yield third-party benefits be "underproduced"?
   Because buyers demand less than they otherwise would if they were receiving all the benefits of consumption, demand is lower, and the quantity supplied is lower.

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UNIT 5, LESSON 3

The Economics of the Environment

Introduction and Description

This lesson uses environmental policy as a case study to help students apply the externality concepts learned in Lesson 2. Activity 67 is an exercise in applying the Marginal Social Benefit = Marginal Social Cost rule to find the optimum amount of pollution for two firms. Activity 68 illustrates ways market forces can be used to clean up the environment. Although many environmentalists cringe at using market incentives to reduce pollution, economists are nearly unanimous in the opinion that market-based approaches will provide a cleaner environment at a lower cost. In Activity 69, the students discover how putting a tax on pollution encourages pollution control and provides incentives to clean up the environment.

Objectives

1. Analyze pollution control by applying cost-benefit analysis.
2. Explain the market-based incentive approach to cleaning up the environment.
3. Analyze the effectiveness of government policies designed to clean up the environment.

Time Required

- Three class periods

Materials

Activities 67, 68, and 69

Procedure

1. Introduce Activity 67 with a brief review of marginal analysis. Tell the students that in Unit 3, they used marginal analysis to understand behavior in the product markets; and in Unit 4, they used marginal analysis to understand behavior in the factor markets. Now they will use marginal analysis to understand societal problems.
2. Be sure to tell students to fill in all the blank columns in the tables before trying to answer the questions.
3. Have the students complete Activity 67.
4. Keep these points in mind as you discuss the answers:

   q.1.a. Correctly interpreted, it costs Firm 1 $160 to reduce pollution emissions by the first unit. The marginal benefit from this emission reduction is $350. Thus, it clearly pays to reduce emissions by this first unit.

   q.1.b. Similarly, it costs Firm 1 $360 to reduce pollution emissions by the fifth unit, while the marginal benefit from this damage reduction is $150. Thus, it clearly does not pay to reduce emissions by this fifth unit of pollution.

   q.2.a. With MSC of $160 less than MSB of $200, it pays for Firm 2 to reduce pollution emissions by the fourth unit.

   q.2.b. The MSC of $160 is greater than the MSB of $150 so it does not pay Firm 2 to eliminate the fifth unit of foul sludge emissions.

   The explanations for questions 3 and 4 are shown on the answer key. Since the basic logic of "keep reducing so long as MSB > MSC and stop reducing when MSB < MSC" lends itself to graphical exposition, and since a graph helps illustrate the social optimum of MSB = MSC, two graphs of the numerical data in this problem are in the answer key for Activity 67.
5. Have the students read Activity 68.
6. Discuss some of the ideas in Activity 68 with the class.
7. Have the students answer the questions at the end of the reading.
8. Discuss the answers.
9. Tell the students that although people may differ on what the proper level of environmental quality should be, most people would agree that whatever level is chosen should be attained as cheaply as possible. Activity 69 illustrates how an emissions charge can create incentives to clean up the environment.
10. Have the students read Activity 69 and answer the questions.
11. Go over the answers to the questions.

Gregory Breuner, lakeridge High School, Lake Oswego, OR, and Mary Jo Thomas, South Eugene High School, Eugene, OR, contributed to this lesson.

ACTIVITY 67 **ANSWER KEY**

Economic Efficiency and the Optimum Amount of Pollution Cleanup

Firm 1

Reduction of Foul Sludge Emissions	Total Social Benefit of Cleanup	Marginal Social Benefit of Cleanup	Total Social Cost of Cleanup	Marginal Social Cost of Cleanup
0	0		0	
		350		160
1	350		160	
		300		**210**
2	650		370	
		250		**260**
3	900		630	
		200		**310**
4	1100		940	
		150		360
5	1250		1300	

1. Using the data from Firm 1, fill in the blanks and cross out the incorrect words in parentheses in each set underlined below.
   a. The marginal social benefit (MSB) of reducing emissions by the first unit of foul sludge is $ **350**, and the marginal social cost (MSC) of reducing pollution emissions by the first unit is $ **160**. The marginal social benefit (MSB) is *(greater than/~~equal to~~/~~less than~~)* the marginal social cost (MSC), so that it *(would/~~would not~~)* be economically efficient from society's perspective to require Firm 1 to reduce pollution emission by the first unit.

   b. The MSB of eliminating the last (fifth) unit of foul sludge is $ **150** and the MSC of reducing pollution emissions by the last (fifth) unit is $ **360**. The MSB is *(~~greater than~~/~~equal to~~/less than)* the MSC so that it *(~~would~~/would not)* be economically efficient from society's perspective to require Firm 1 to reduce pollution emission by the fifth unit.

ACTIVITY 67 ANSWER KEY continued

Firm 2

Reduction of Foul Sludge Emissions	Total Social Benefit of Cleanup	Marginal Social Benefit of Cleanup	Total Social Cost of Cleanup	Marginal Social Cost of Cleanup
0	0		0	
		350		160
1	350		160	
		300		160
2	650		320	
		250		160
3	900		480	
		200		160
4	1100		640	
		150		160
5	1250		800	

2. Using the data from Firm 2, fill in the blanks and cross out the incorrect words in parentheses in each set underlined below.
   a. The marginal social benefit (MSB) of eliminating the fourth unit of foul sludge is $ **200** , and the marginal social cost (MSC) of reducing pollution emissions by that fourth unit is $ **160** . The MSB is *(greater than/~~equal to~~/~~less than~~)* the MSC so that it *(would/~~would not~~)* be economically efficient from society's perspective to require Firm 2 to reduce pollution emissions by four units.

   b. The MSB of eliminating the fifth (last) unit of foul sludge is $ **150** , and the MSC of reducing pollution emissions by that fifth (last) unit is $ **160** . The MSB is *(~~greater than~~/~~equal to~~/less than)* the MSC so that it *(~~would~~/would not)* be economically efficient from society's perspective to require Firm 2 to reduce pollution emissions by five units.

3. If this community decides to adopt a pollution control ordinance aimed at maximizing economic efficiency, how should it evaluate each of the following three proposals, all of which are based on the data presented above? Write a brief economic evaluation in the space provided after each of the following proposals. Be sure to use the concepts of marginal social benefit and marginal social cost in your analysis.

Proposal A. "Foul sludge emissions should be reduced (by five units) to zero in each firm because we should eliminate all pollution from our lakes regardless of the cost." This proposal *(~~would~~/would not)* maximize *economic efficiency*, because:

Economic efficiency considers *marginal* social costs and *marginal* social benefits.

MSB < MSC after Firm 1 reduces 2 units.

MSB < MSC after Firm 2 reduces 4 units

Therefore, it would *not* be economically efficient to make either firm reduce 5 units because the MSB would be less than the MSC.

ACTIVITY 67 ANSWER KEY continued

Proposal B. "Firm 2 should be forced to reduce emissions (by five units) to zero because the total social benefit of cleanup ($1,250) exceeds the total social cost of cleaning up ($800). But Firm 1 should not be forced to clean up at all, because the total social benefit of clean up ($1,250) is less than the total social cost of reducing emissions to zero ($1,300)." This proposal *(~~would~~/would not)* maximize economic efficiency, because:

It is *marginal* (not total) benefits and *marginal* (not total) costs that count in finding the optimum point of economic efficiency.

If Firm 2 reduces 5 units and Firm 1 reduces 0 units, the total net gain is $450 ($1,250-$800) from Firm 2.

However, if Firm 2 reduces only 4 units and Firm 1 reduces 2 units, the total net gain is $740.

$460 ($1,100 - $640) from Firm 2
$280 ($650 - $370) from Firm 1
$740

Proposal C. "In the interest of equal treatment for all, each firm should be forced to clean up (reduce emissions) by three units." This proposal *(~~would~~/would not)* maximize economic efficiency because:

Making Firm 1 reduce a third unit would result in MSB < MSC.

Stopping Firm 2 at three units would leave MSB > MSC.

Efficiency would increase if Firm 1 cut back to reducing 2 units, and Firm 2 continued reducing to a fourth unit.

With each reducing 3 units the total net gain is $690.
Firm 1: $900 - $630 = $270
Firm 2: $900 - $480 = $420
$690

With Firm 1 reducing 2 units and Firm 2 reducing 4 units the total net gain is $740.
Firm 1: $650 - $370 = $280
Firm 2: $1,100 - $640 = $460
$740

4. Using the data presented above, what do you think is the optimum level of emissions reduction for each firm?

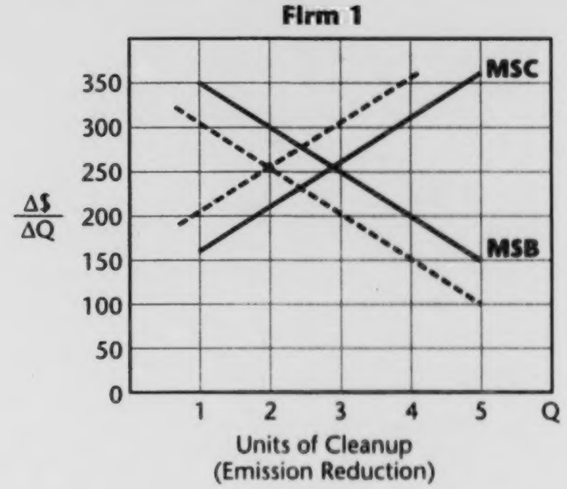
Firm 1 __**2**__ units.

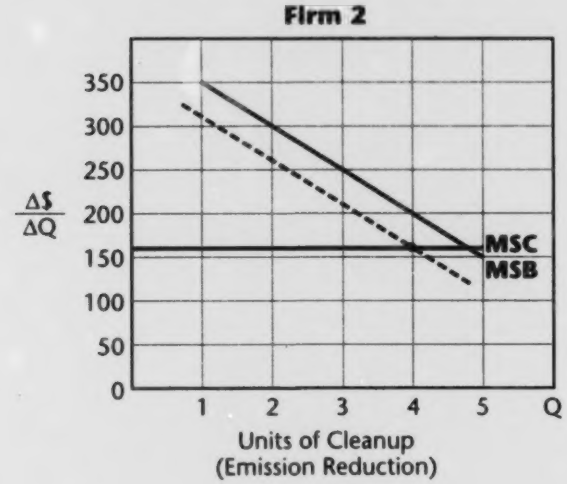
Firm 2 __**4**__ units.

Explain briefly why you chose the numbers that you did.

For Firm 1, MSB > MSC up to a reduction of 2 units; beyond this point MSB < MSC. For Firm 2, MSB > MSC up to a reduction of 4 units; beyond this point MSB < MSC. No other combination yields a total net gain greater than $740.

ACTIVITY 67 ANSWER KEY continued





ACTIVITY 68 **ANSWER KEY**
Free-Market Environmentalism

1. Why doesn't the market automatically clean up the environment?
Sellers are able to push costs onto third parties. In a competitive market, a seller that would voluntarily reduce these air and water emissions would have higher costs and become uncompetitive.

2. What is wrong with the command and control system of cleaning up the environment? Why shouldn't every business, home, or car meet the same environmental standard? (Hint: Refer to Activity 67 for an answer.)
Not every business or consumer has the same marginal cost of cleanup. Some people can exceed the standards while others don't even have the technology to meet them. The command and control system does not give any business an incentive to do better than the standard. It does not give businesses an incentive to develop new technologies. Also, inefficient methods of cleaning up the environment may be mandated.

3. Explain why taxing pollution can cause firms to clean up their pollution. Use costs and benefits in your answer.
Businesses will want to avoid the tax (a cost of production) which they can do only by reducing their emissions. Businesses will try to develop new technologies to avoid the tax. Meanwhile, the tax revenues can be used by government to fund research on the environment or to provide further reductions in pollution.

4. Explain why establishing marketable pollution permits will help clean up the environment. Use costs and benefits in your answer.
Businesses with low marginal costs of cleanup will exceed the standard, and those with high marginal costs of cleanup can buy these permits. This system provides an incentive to keep cleaning up the environment and encourages low-cost methods of cleanup.

5. True, false, or uncertain, and why? "We cannot give anyone the option of polluting for a fee."
***False.* The whole point is to have less pollution. If this can be done for a lower cost, then resources can be used for other purposes.**

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ACTIVITY 69 **ANSWER KEY**
Paying To Use A Scarce Resource: Carbon and Sulfur Taxes

1. How are these taxes like the payments for the other resources used in the production of electricity?
   They represent a payment for the use of a scarce resource—in this case, the air—as a depository for carbon and sulfur emissions.

2. How would these charges affect the demand and/or supply curves in the graph *Price and Quantity of Electricity*?
   This does not alter people's willingness or ability to pay for electricity so the demand curve is not affected. The costs of producing electricity would, however, rise; producers therefore would require greater compensation for a given output level. This would be shown by an upward (or leftward) shift of the supply curve.

3. How would this affect the equilibrium quantity of electricity produced and its equilibrium price?
   The equilibrium quantity would fall while price would rise.

4. How would this affect the amount of carbon and sulfur emissions?
   Since less electricity is produced, the quantity of emissions would also decrease.

5. How might these charges lead to changes in the way electricity is produced?
   Producers are always looking for the least costly way of producing their outputs (the profit motive). If they have to pay to use the air as a depository for emissions, they will likely consider using "cleaner" fossil fuels (lower-sulfur coal, natural gas). They might also consider alternate energy sources (hydro, wind, geothermal) in an effort to avoid the emissions taxes altogether.

UNIT 5, LESSON 4

When Government Fails

Introduction and Description

Lessons 1 through 3 stress the economic functions of government with particular emphasis on market failures. This lesson deals with government failure and provides balance in evaluating the role of government.

Throughout their education, students have been told that democratic governments try to improve society. They learn that some political leaders may be stupid, incompetent, or corrupt, but a responsible electorate can vote them out of office. Furthermore, poor leadership is often blamed on political apathy. Most civics and government classes stress the reasons that citizens should vote and actively participate in the political process.

Public-choice economists believe all this good government stuff is bunk and that when political activity is studied with the tools of economics, government will be seen to fail more often than markets will. Their analysis shows why there is not much difference between the political parties, why special interests prevail over the public good, why it is rational not to vote, and why bureaucrats are inefficient. It is *not* a matter of getting the right people in government. Rather, government fails because politicians and bureaucrats are trying to maximize their ability to gain votes and power. Their behavior is as self-interested as anyone else's.

This lesson should increase students' skepticism toward government. They may agree with Winston Churchill who said that democracy is the worst form of government except for the alternatives.

Objectives

1. Describe the basic tenets of the public-choice model of government behavior.
2. Analyze reasons self-interest leads to the public good in a private market but does not lead to the public good in the government sector.
3. Analyze political behavior using the theory of public choice.

Time Required

- Two class periods

Materials

1. Activities 70 and 71
2. Visual 5.4

Procedure

1. Begin the lesson with an idea suggested by Ralph Byrns and Gerald Stone (*Great Ideas for Teaching Economics*, fifth edition, HarperCollins, p. 457). "A quick poll of the students in virtually any college classroom will reveal a widespread call for 'lower taxes and less government.' After ascertaining that this is true through a show of hands in your class, either list a large number (20 or so) of present or proposed government activities (e.g., national health care, national defense) on a chalkboard or pass out detailed lists of such activities (perhaps to have students take them home to record their responses). One activity at a time, have students indicate by a show of hands whether they favor: (a) eliminating the specific activity by government; (b) substantially decreasing the funding for the activity; (c) keeping the activity at present levels; or (d) increasing the government's participation in this area. They will be surprised (and you may be as well) when virtually all classes vote for substantial net expansions of many, or even most, government programs. When asked to account for this seeming paradox, some students may argue that most people want greater efficiency—more and better quality government services at lower tax costs. You can question whether greater efficiency in government is likely, regardless of who holds office, and then contrast the efficiency of marketplace resource allocations with those resulting from public sector decision making. We have found that this exercise invariably generates enthusiastic class participation."
2. Give a lecture on the basic ideas of the

LESSON 4 continued

public-choice school of economics using Visual 5.4. Here are some points to make:

Question 1.: Is it rational for government leaders to favor special interests over the general public interest?

This is an important point in the public-choice doctrine. The idea is that special interests have a big stake in government. Therefore, they take a big interest in government. When they give politicians contributions and support, the politicians know it. Each member of the public may lose just a little when a special interest gets its way so the public doesn't pay attention. Furthermore, the public is ignorant. Therefore, the politician goes with the special interest. The more concentrated the benefit for the special interest and the more diffused the cost to the public, the more likely the special interest will get its way.

Question 2.: Why are politicians mainly in the middle of the road?

The median voter hypothesis predicts that politicians, regardless of party, will appeal to the median voter in the constituency they represent. It also predicts that politicians will take a more extreme position in the party primary election (when they are appealing to the median voter in the party) than in the general election.

Question 3.: Are people rational or irrational when they spend little time evaluating candidates before they vote and when they don't vote?

This is known as rational ignorance. Why be informed about the candidates when your vote counts so little? Why even vote? If this is true, why do so many people vote? The public-choice answer is that voting is a consumption activity. Voting gives people a feeling that they did their civic duty. By voting, they can complain without guilt when they don't like a government policy.

Question 4.: What is the effect of bureaucratic entrepreneurs on government?

A business is successful if it can maximize profits. A bureaucrat is successful if he or she can maximize power. Bureaucrats are rewarded when they expand the duties and clientele of their departments. A bureaucrat will have a smaller department if it becomes more efficient. Bureaucrats have an incentive to expand their departments, not to reduce them. With larger departments come more power, a bigger office, a higher salary, and a larger pension.

3. Have the students read Activity 70 and answer the questions.
4. Discuss the answers to the questions.
5. Have the students work in small groups to solve the mysteries in Activity 71.
6. Have the entire class discuss the solutions to the mysteries.

ACTIVITY 70 **ANSWER KEY**
Public-Choice Economics

1. You are a candidate for Congress. Half the voters in your district favor a certain government policy and half oppose it. What position will you take on the issue? Why?
   You will appeal to the median voter because that will maximize your votes. It is in your self-interest to get re-elected.

2. You won your election to Congress. A majority of voters in your district favor gun control. However, the National Rifle Association is fighting gun control, and if you vote against gun control, it will make a large financial contribution to your next campaign and provide campaign workers. How will you vote on gun control bills? Why?
   This depends on how important an issue gun control is in your district. Even though your constituents favor gun control, they may not be voting on that issue. If you can get the NRA support while keeping your constituents ignorant, you might vote "no" on gun control.

3. In fiscal year 1994, Social Security and Medicare were expected to account for $464.1 billion or 31.3 percent of total federal expenditures. As a member of Congress, you realize that the budget cannot be balanced unless laws are passed that allow for cuts in these programs. However, 20 percent of your constituents receive Social Security payments. Many of them are also members of the American Association of Retired People, a lobbying group that supports members of Congress who are against cutting Social Security. Will you support enacting new laws that would cut Social Security programs? Why or why not?
   Social Security and Medicare benefits are known as "entitlements," and the term means that certain people are legally entitled to these benefits because they meet a set of legal qualifications. Even people not currently receiving Social Security are paying taxes for future benefits. Almost everyone either receives Social Security or expects to receive it someday. It is very difficult for U.S. Senators and Representatives to cut Social Security and be re-elected. This is why it is so hard to cut a government budget.

4. Your constituents believe that they should get a better return on their tax dollars. Of the taxes sent to Washington, your Congressional district is not getting enough back to fund projects locally. A new research facility for energy technology is proposed, and your district is in the running for it. Other members of Congress will support a bill to put the laboratory in your district if you support programs for their districts. However, you are a founding member of Porkbusters, a caucus group committed to cutting unnecessary federal spending. Will you make the deals necessary to get the energy research lab for your district? Why or why not?
   The key to this question is logrolling, which is an exchange of votes among legislators. You help me and I help you. This is one reason why government spending is so high and why there are budget deficits.

5. You lost your attempt to be re-elected to Congress, but you got a job as a bureaucrat in the Department of Education. You are in charge of collecting information about schools. You are aware of efficient computer technology that would make the collection of this information quicker and less expensive. However, this would

ACTIVITY 70 ANSWER KEY continued

mean that several people under your supervision will lose their jobs. You know that your status, power, and salary depend on the size of your department. There are no profits in government. Will you push for the adoption of the new technology? Why or why not?
You would not. More employees mean a higher salary and more prestige.

ACTIVITY 71 **ANSWER KEY**
Solving the Mysteries of Government

Answer the following questions using ideas from the public-choice theory of government.

1. In fiscal year 1995, the federal budget deficit was over $200 billion, and the national debt was about $5 trillion. Yet nearly every politician is in favor of cutting the deficit and reducing the debt. Then why don't Congress and the President do it?
Almost all people claim to want to cut the budget—except for the programs they favor. In order to obtain programs for their constituents, legislators engage in logrolling. Almost every member of Congress favors a balanced budget, but it never happens because in pursuing their self-interest in re-election, legislators must make deals.

2. Why would the government impose a tax that would cause thousands of people to lose their jobs while at the same time raising little or no revenue?
The government did this when it passed a ten-percent luxury tax on yachts. This allowed members of Congress to say they were making the rich pay their share, but it discouraged people from buying new yachts. Almost overnight boat sales in southern Florida dropped 88 percent. Many people decided to purchase used yachts or to substitute other forms of recreation such as a lake home or a European vacation. Tax revenue from yacht sales was far below expectations. Who made yachts? Yachts were built by small companies that employed blue-collar workers and craftspeople. These firms often produced five or six yachts a year. It is estimated that 19,000 of these workers lost their jobs due to the sharp decline in sales. These people were likely to be paying far less in income taxes. The ripple effects spread to suppliers and local merchants. In 1994, after the entire yacht industry was nearly destroyed, Congress repealed this tax.

3. If free trade improves a nation's standard of living, why do so many countries have tariffs, quotas, and other barriers to trade?
Some individual firms and employees get relatively large benefits from tariffs and quotas. These benefits have costs, and consumers pay more for the goods. For example, consumers paid $42,000 for every textile job saved by trade barriers, $105,000 for every auto job saved, and $750,000 for every steelworker's job saved. Because these costs are spread over millions of consumers and most of them don't even notice the higher prices, legislators vote in favor of the trade restrictions in order to please the few people receiving large benefits.

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ACTIVITY 71 ANSWER KEY continued

4. Farm price supports cost taxpayers billions of dollars each year. The purpose of farm price supports is to raise the price of agricultural products, which costs consumers more money. Direct payments to dairy farmers alone cost taxpayers a lot of money. In Florida in a recent year, dairy farmers received $40.3 million in price support payments. Most of this money went to 177 farmers. Each of these farmers received an average payment of $226,000. In a recent year, a bill was introduced in Congress to lower price supports for dairy farmers. Even though 55 percent of milk production takes place in five states and even though a majority of Congressional districts have no dairy farmers, the bill was soundly defeated. Why?
The logic is the same as for question 3. Almost all democratic governments have price supports for their farmers. The reason is the large benefit for farmers and the small cost for each consumer. Even if most legislators do not have dairy farmers in their districts, they still need to make logrolling deals.

5. Farming occurs in 16 percent of the 3,042 counties in the United States. Nevertheless, the U.S. Department of Agriculture maintains 11,000 offices in 2,859 counties; this is 94 percent of the counties in the United States. In 1950, there were ten million farmers and 84,000 employees in the Department of Agriculture. In 1990, there were 2.9 million farmers and 129,000 employees in the Department of Agriculture. If this trend continues, by 2000, there will be 145,000 farmers and 146,000 employees in the Department of Agriculture. How could this happen?
This question is answered by the public-choice theory of economic behavior.

UNIT 5, LESSON 5

The Economics of Taxation

Introduction and Description

Previous lessons have examined the role and size of government. In this lesson, students study taxes: the money that finances government activities. The Activities in this lesson cover tax equity and tax incidence, concepts that are most likely to appear on the AP exam. Before completing these Activities, students should have an overview of tax policy, which is covered in all college economics texts.

Objectives

1. Define and differentiate between the *ability-to-pay* and *benefits-received* theories of taxation.
2. Define and differentiate among *progressive, proportional,* and *regressive* taxes.
3. Explain the ways tax incidence is shifted and the qualities of the product that affect forward and backward shifting of tax incidence.
4. Develop criteria for evaluating the fairness of a tax.

Time Required

- Two class periods

Materials

1. Activities 72 and 73
2. Visual 5.5

Procedure

1. Have the students read Activity 72 until they reach the questions.
2. Give a lecture-discussion on tax equity that covers these points:
    a. The difference between the *ability-to-pay* and the *benefits-received* theories of taxation.

    b. The difference between a *nominal* and an *effective tax rate.*

    c. The definitions of *progressive, proportional,* and *regressive taxes.* Be sure to make clear that the rate must be an effective rate applied against *income.* Students confuse an income tax base with other tax bases, such as consumption or wealth. For example, they might incorrectly conclude that the sales tax is a proportional tax since the rate is the same for everyone. They will not distinguish between a consumption base and an income base.
3. Have students answer all the questions in Activity 72.
4. Give a lecture on tax incidence, using Visual 5.5. Cover these points:
    a. Often the person who actually pays the government does not bear the burden of the tax. The person who bears the burden of the tax is said to bear the *incidence* of the tax.

    b. Taxpayers will shift the incidence of a tax whenever possible.

    c. The incidence of a tax can be shifted only when the taxpayer can get a higher price for something he or she sells or a lower price for something he or she buys.

    d. If the taxpayer is able to raise the price of something he or she sells, the tax is shifted forward. If the taxpayer is able to lower the price of something he or she buys, the tax is shifted backward.

    e. How much of the incidence of a tax can be shifted depends on the elasticity of the supply and demand curves. The incidence is heaviest on the most inelastic curve.
5. Have students review Activity 73. This problem is an application of the supply-and-demand model. Actual numbers are supplied so that students can get practice in interpreting diagrams for quantity and revenue implications as well as for equilibrium prices. Excise taxes can be analyzed by shifting either the supply or demand curve (but only one) by the amount of the tax.

LESSON 5 continued

6. Have students do page 1 of Activity 73 to make sure they know how to analyze the data.
7. Go over page 1 of Activity 73.
8. Have students complete the problem.
9. Discuss the answers. You can make transparencies of the graphs in the answers and illustrate the three cases by coloring in different rectangles as the answers are developed.

ACTIVITY 72 **ANSWER KEY**
What Is a Fair Tax?

1. A tax where each person pays three percent regardless of income is a **proportional or flat** tax.

2. A tax levied at one percent on the first $1,000 of income, two percent on the next $1,000, and so on is a **progressive** tax.

3. A tax levied at 15 percent on the first $1,000 of income, 12 percent on the next $1,000, and so on is a **regressive** tax.

4. If it is true that a person with an income of $20,000 a year typically buys six packs of cigarettes per week and a person with an income of $40,000 typically buys nine packs of cigarettes per week, this suggests that an excise tax of ten cents per pack would be a **regressive** tax. Explain.
   The richer person has double the income but buys only 50 percent more cigarettes. You might point out that many excise taxes are regressive. Of course, excise taxes on luxury goods such as furs and jewelry would not be regressive if most of the people buying these goods were wealthy. Then ask, "Why do we have so many excise taxes?" The answer is that they are politically more acceptable because they are either hidden or paid in such small amounts that taxpayers do not consider the total burden of the tax.

5. Rick Morales has an income of $25,000 and spends it all on taxable goods. Chet Burton has an income of $50,000 but spends only $40,000 on taxable goods. Assuming an eight percent sales tax, Mr. Morales will pay $ **2,000** in sales taxes, which is **8** percent of his total income. On the other hand, Mr. Burton will pay $ **3,200** in sales taxes, which is **6.4** percent of his total income. Therefore, we can conclude that the sales tax is **regressive** .

6. Since the sales tax has the same nominal or legal rate based on sales, why is it regressive? What steps could be taken to make it less regressive?
   The sales tax base is consumption, not income. Most states do not include services in their sales tax base. Since the rich purchase more services, taxing services would make the tax less regressive. It would also raise more revenue. Since the poor pay a greater percentage of their income on food, exempting food also makes the tax less regressive. Several states exempt food from sales taxes.

7. Most people in the United States pay Social Security taxes. The employee's rate in 1994 was 6.2 percent on the first $60,600 of income. All income in excess of $60,600 was not taxed for Social Security purposes.
   a. What was the effective Social Security tax rate in 1994 for a person earning $20,000 a year? **6.2%**
   b. What was the effective Social Security tax rate for a person earning $60,600? **6.2%**
   c. What was the effective Social Security tax rate for a person earning $121,200? **3.1%**
   d. Therefore, the Social Security tax is a *(~~progressive~~/proportional/~~regressive~~)* tax

ACTIVITY 72 ANSWER KEY continued

up to $60,600 of income. For incomes above **$60,600**, the Social Security tax is *(~~progressive/proportional~~/regressive)*.

e. In addition to the Social Security tax, people must pay 1.45 percent of their income for Medicare benefits. There is no income limit on the Medicare tax. Does this make the total tax for Social Security and Medicare more or less regressive? Why?
It makes it less regressive because people earning over $60,600 must pay some tax.

8. Do you think the fairest tax is progressive, proportional, or regressive? Why?
This is an opinion question that may show the difficulty in determining what is a fair tax. Few students should defend regressive taxation, but opinions should differ on whether progressive or proportional taxation is fairer.

ACTIVITY 73 **ANSWER KEY**
Excise Taxes

Suppose the following graph and table show the current supply of Greebes.

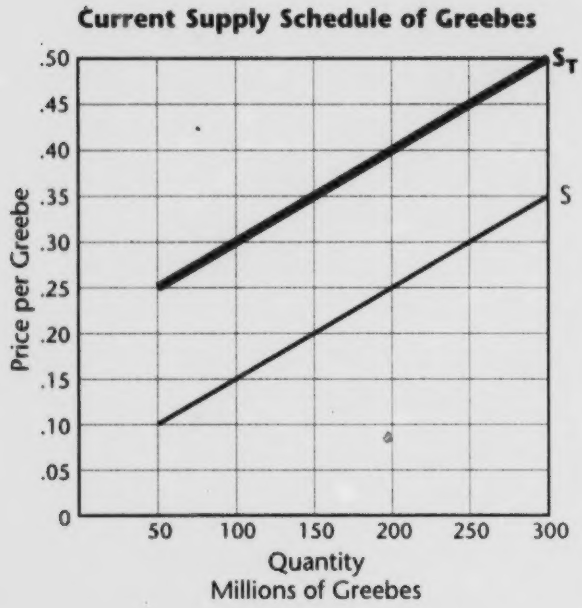


Table of Current Supply Schedule of Greebes

Quantity (millions)	Supply price before tax ($ per Greebe)	Supply price after tax ($ per Greebe)
50	$.10	**.25**
100	.15	**.30**
150	.20	**.35**
200	.25	**.40**
250	.30	**.45**
300	.35	**.50**

Now suppose that (to raise revenue for higher education) the government enacts an excise (sales) tax of $.15 per Greebe. *This tax will result in a new supply curve for Greebes.* To determine where this new supply curve lies, reason as follows: If before the tax, firms were willing to supply 50 million Greebes at a price of $.10, they would now be willing to supply 50 million Greebes only if the price were $.25. (Remember: $.15 of the price of each Greebe sold is now going to go to the government. So, if the price is $.25 and the government is getting $.15 of this price, then the seller is receiving the remaining $.10.)

Fill in the blank spaces in the table and draw in the new supply curve resulting from the tax. Label the new supply curve S_T.

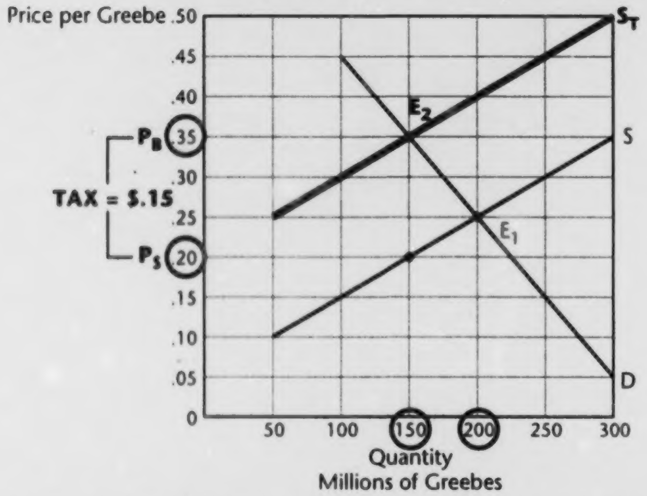
What will be the result of this excise (sales) tax on: The equilibrium quantity of Greebes? The equilibrium price paid by buyers (*Pb*)? The equilibrium price received by sellers (*Ps*)? The revenue received by the government? And the income or revenue received by sellers after the tax?

The answers to these important questions will depend on the nature of the demand for Greebes. The next section of this Activity will help you determine the effects of a $.15 excise tax on Greebes under four different demand conditions. After you have completed these, there are some additional, less mechanical, questions for you to think about and answer.

ACTIVITY 73 ANSWER KEY continued

Part A.

Relatively Inelastic Demand for Greebes



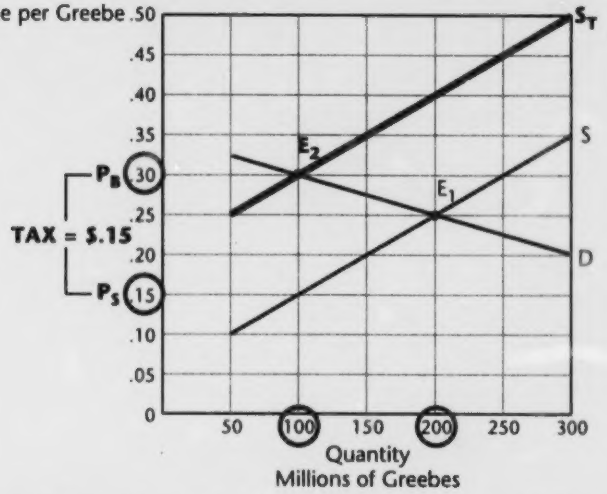
1. On the graph *Relatively Inelastic Demand for Greebes*, the equilibrium quantity of Greebes is **200** million. **Q_{E1}**
2. On the graph, the equilibrium price of Greebes is $ **.25** per Greebe. **P_{E1}**
3. Buyers are spending a total of $ **50** million on Greebes. **(.25 x 200 = 50)**
4. Sellers are receiving a total of $ **50** million from selling Greebes. **(.25 x 200 = 50)**
5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_B) will differ from the equilibrium price received by sellers (P_S) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   a. The new equilibrium quantity of Greebes would be **150** million. **Q_{E2}**
   b. The new equilibrium price paid by buyers would be $ **.35** per Greebe. **($P_B = P_{E2}$)**
   c. The new equilibrium price received by sellers (after tax) would be $ **.20** per Greebe. **($P_S = P_B$ – TAX or $.35 – .15 = .20)**
   d. Buyers would spend a total of $ **52.5** million on Greebes. **(P_B x 150 = $.35 x 150)**
   e. Sellers would receive a total of $ **30** million (after tax) from selling Greebes. **(P_S x 150 = $.20 x 150)**
   f. The government revenue from this tax would be $ **22.5** million. **(TAX x 150 = $.15 x 150)**
   g. $ **15** million of this revenue would be paid by buyers in the form of higher prices. **($P_B – P_{E1}$ x 150 = $.35 – .25 = $.10 x 150)**
   h. $ **7.5** million of this revenue would be paid by sellers in the form of reduced income. **($P_{E1} – P_{ST}$ x 150 = $.25 – .20 = $.05 x 150)**
   i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ **12.5** million. **200 – 150 x $.25 = 50 x $.25 = 20 or 50 (4)**

-30 (5e)
20
-7.5 (5h)
12.5

ACTIVITY 73 ANSWER KEY continued

Part B.

Relatively Elastic Demand for Greebes



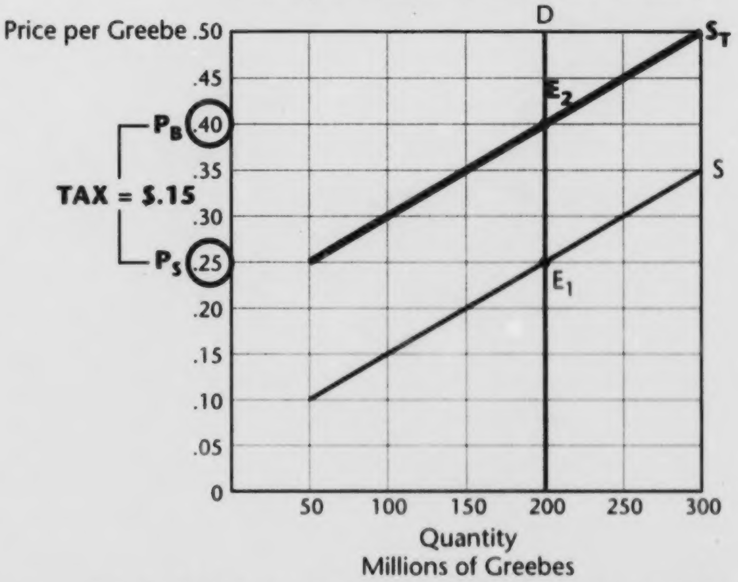
1. On the graph *Relatively Elastic Demand for Greebes,* the equilibrium quantity of Greebes is **200** million. **Q_{E1}**
2. On the graph, the equilibrium price of Greebes is $ **.25** per Greebe. **P_{E1}**
3. Buyers are spending a total of $ **50** million on Greebes. **(.25 x 200 = 50)**
4. Sellers are receiving a total of $ **50** million from selling Greebes. **(.25 x 200 = 50)**
5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_B) will differ from the equilibrium price received by sellers (P_S) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   a. The new equilibrium quantity of Greebes would be **100** million. **Q_{E2}**
   b. The new equilibrium price paid by buyers would be $ **.30** per Greebe. **($P_B = P_{E2}$)**
   c. The new equilibrium price received by sellers (after tax) would be $ **.15** per Greebe. **($P_S = P_B$ – TAX or $.30 – .15 = .15)**
   d. Buyers would spend a total of $ **30** million on Greebes. **(P_B x 100 = .30 x 100 = 30)**
   e. Sellers would receive a total of $ **15** million (after tax) from selling Greebes. **(P_S x 100 = $.15 x 100 =15)**
   f. The government revenue from this tax would be $ **15** million. **(TAX x 100 = $.15 x 100)**
   g. $ **5** million of this revenue would be paid by buyers in the form of higher prices. **(P_B –P_{E1} x 100 = $.30 – .25 = .05 x 100 = 5)**
   h. $ **10** million of this revenue would be paid by sellers in the form of reduced income. **(P_{E1} – P_S x 100 = $.25 – .15 = .10 x 100 = 10)**
   i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ **25** million. **200 – 100 x $.25 =100 x .25 = 25 or 50 (4)**

–15 (5e)
35
–10 (5h)
25

ACTIVITY 73 ANSWER KEY continued

Part C.

Perfectly Inelastic Demand for Greebes

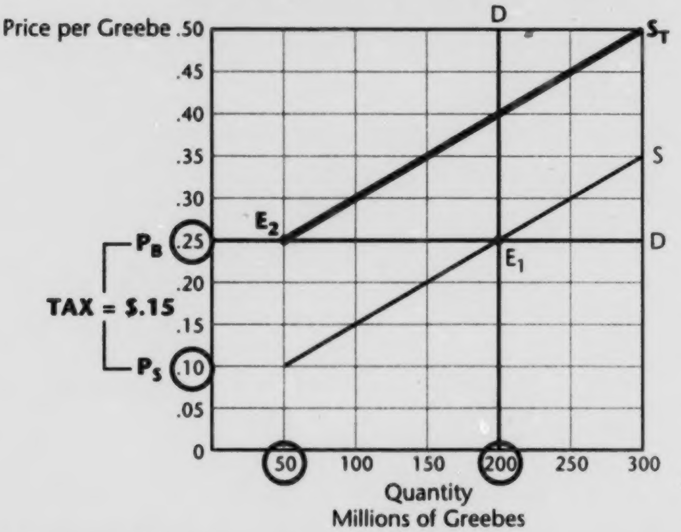


1. On the graph *Perfectly Inelastic Demand for Greebes,* the equilibrium quantity of Greebes is _200_ million. **Q_{E1}**
2. On the graph, the equilibrium price of Greebes is $ _.25_ per Greebe. **P_{E1}**
3. Buyers are spending a total of $ _50_ million on Greebes. **(.25 x 200 = 50)**
4. Sellers are receiving a total of $ _50_ million from selling Greebes. **(.25 x 200 = 50)**
5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_B) will differ from the equilibrium price received by sellers (P_S) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   a. The new equilibrium quantity of Greebes would be _200_ million. **(Q_{E2})**
   b. The new equilibrium price paid by buyers would be $ _.40_ per Greebe. **($P_B = P_{E2}$)**
   c. The new equilibrium price received by sellers (after tax) would be $ _.25_ per Greebe. **($P_S = P_B$ – TAX = .40 – .15 = .25)**
   d. Buyers would spend a total of $ _80_ million on Greebes. **(P_B x 200 = .40 x 200 = 80)**
   e. Sellers would receive a total of $ _50_ million (after tax) from selling Greebes. **(P_S x 200 =.25 x 200 = 50)**
   f. The government revenue from this tax would be $ _30_ million. **(TAX x 200 = $.15 x 200)**
   g. $ _30_ million of this revenue would be paid by buyers in the form of higher prices. **(.40 – .25 = .15 x 200 = 30)**
   h. $ _0_ million of this revenue would be paid by sellers in the form of reduced income. **($Q_{E1} = Q_{E2}$)**
   i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ _0_ million. **There is no "uncollected revenue loss."**

ACTIVITY 73 ANSWER KEY continued

Part D.

Perfectly Elastic Demand for Greebes



1. On the graph *Perfectly Elastic Demand for Greebes,* the equilibrium quantity of Greebes is 200 million. **Q_{E1}**
2. On the graph, the equilibrium price of Greebes is $ .25 per Greebe. **P_{E1}**
3. Buyers are spending a total of $ 50 million on Greebes. **(.25 x 200 = 50)**
4. Sellers are receiving a total of $ 50 million from selling Greebes. **(.25 x 200 = 50)**
5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_B) will differ from the equilibrium price received by sellers (P_S) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   - a. The new equilibrium quantity of Greebes would be 50 million. **(Q_{E2})**
   - b. The new equilibrium price paid by buyers would be $ .25 per Greebe. **($P_B = P_{E2}$)**
   - c. The new equilibrium price received by sellers (after tax) would be $ .10 per Greebe. **($P_S = P_B$ – TAX = .25 – .15 = .10)**
   - d. Buyers would spend a total of $ 12.5 million on Greebes. **(P_B x 50 = $.25 x 50)**
   - e. Sellers would receive a total of $ 5 million (after tax) from selling Greebes. **(P_S x 50 = $.10 x 50 =5)**
   - f. The government revenue from this tax would be $ 7.5 million. **(.15 x 50 = 7.5)**
   - g. $ 0 million of this revenue would be paid by buyers in the form of higher prices. **($P_B = P_{E1}$ or $P_B - P_{E1} = 0$)**
   - h. $ 7.5 million of this revenue would be paid by sellers in the form of reduced income. **($P_{E1} - P_S$ x 50 = .25 – .10 = .15 x 50 = 7.5)**
   - i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ 37.5 million. **200 – 50 x .25 =150 x .25 = 37.5 or 50 (4)**

-5 (5e)
45
-7.5 (5h)
37.5

ACTIVITY 73 ANSWER KEY continued

Part E.

1. A famous Supreme Court justice once said: "The power to tax is the power to destroy [sellers]." This is more likely to be true the more the demand for the product taxed is relatively *(elastic/~~inelastic~~)*. (Cross out the incorrect word.)
   See Part D.

2. If you were a government revenue agent interested in getting the most tax revenue possible, you would suggest putting excise taxes on goods whose demand is *(~~elastic~~/~~unit-elastic~~/inelastic)*. (Cross out the incorrect word.)
   See Part C.

3. Think of some real-world goods on which excise taxes are placed (e.g., liquor, cigarettes, gasoline). Do you think that the demand for these goods is relatively elastic or relatively inelastic? Why?
   ***Relatively inelastic.* No good substitutes for the addicted. Also, considerable revenue is collected from these taxes.**

4. In this problem the price elasticity of supply has been held constant in all four cases. How might a change in the price elasticity of supply affect the results of imposing an excise tax? Why?
   The more *inelastic* the supply, the more "burden" would fall on suppliers. Work out with different supply curves on a constant demand curve or use D_T analysis shown above on different supply curves.

Part F.

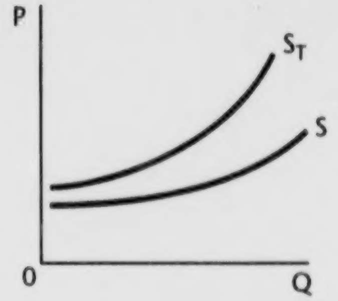
Consider the newspaper quotation and the questions that follow. You do not have to write out answers to the questions, but you should thoughtfully consider them for class discussion.

> "The city is planning to place a 10% tax on auto parking. The tax would fall on every motorist who uses a space in either the garages and the lots operated by the Public Parking Authority or in privately operated lots and garages."

1. Draw the demand curve and the long-run supply curve for parking lots. Explain why each has the shape you show, i.e., why each is relatively elastic or inelastic.
   The *long-run* supply curve would *not* be perfectly inelastic. Additional parking places could be added as prices increased. Existing facilities now used for other things could be converted to parking garages, and additional stories could be added to existing garages if the price increased enough.
   The elasticity of the total demand curve is the result of the relative elasticity of demand for *different groups* of downtown parkers, and the strength of the substitution effect and the income effect for these groups. Downtown shoppers have more substitutes (e.g., suburban shopping malls with free parking) than do downtown office workers, but even office workers could form car pools and/or use public transportation if the price of parking increased sufficiently. The income effect would be larger for office workers who come every day than for occasional shoppers.

ACTIVITY 73 ANSWER KEY continued

2. Given the curves you have drawn in 1, show the effect of introducing a 10% tax; i.e., how does the equilibrium position after imposition of the tax compare with the initial equilibrium position?
   Price would be higher. Number of spaces used would be smaller. See Part C, except a percentage tax would result in S_T getting progressively farther from S compared to Part C, where tax was a fixed cents per unit rather than percentage.



3. The newspaper quotation implies that the "burden" of the tax will fall entirely upon the driver. Is this true for the case you have developed in 1 and 2 above? Under what circumstances would it be true?
   No, there would most likely be some "sharing" of the burden, since neither supply nor demand is perfectly inelastic.
   The burden would fall entirely upon the driver if demand was perfectly inelastic. See Part A.

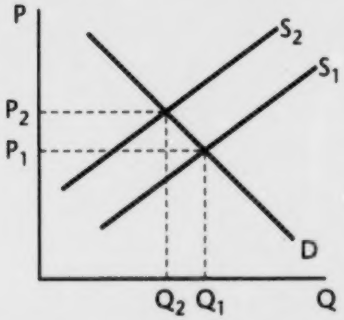
Answers to Sample Multiple-Choice Questions

1. b
2. e
3. b
4. e
5. b
6. a
7. b
8. b
9. a
10. c
11. e
12. a
13. c
14. b
15. c
16. d
17. c
18. c
19. b
20. d
21. c
22. a
23. d
24. a
25. d

Answers to Sample Short Essay Questions

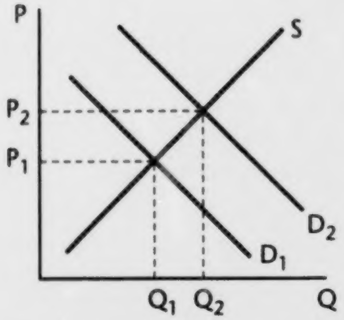
1. Education meets the criterion of shared consumption, and it may create positive externalities. However, education is not a pure public good because it does not meet the criterion of nonexclusion. People can be excluded from an educational system by imposing tuition, which many private schools do.

2.



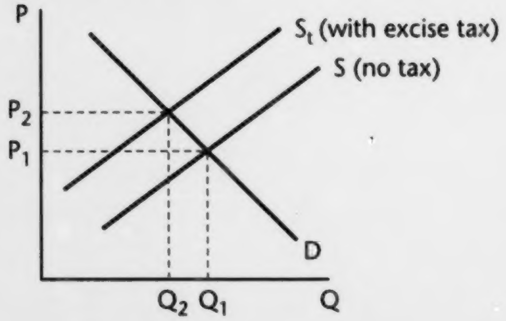
The correct output for society is Q_2. However, because of the externalities, the actual output is Q_1 and the price is P_1. Taxing the emissions would decrease supply from S_1 to S_2. This would increase the price and reduce the output to the level where all externalities would be internalized. Without considering the negative externalities, the price is too low and the output too high for an efficient allocation of resources.

3.



Because the positive externalities are not considered, the demand based on buyer benefits is only D_1. If societal benefits were considered, the demand would be greater, shifting to D_2. Without considering external benefits, both the price and output are too low for an efficient allocation of resources.

4. It does not reflect sound economic reasoning. Unless the demand for the good is perfectly elastic, some of the incidence of the excise tax could be shifted to the consumer as illustrated in the graph below.



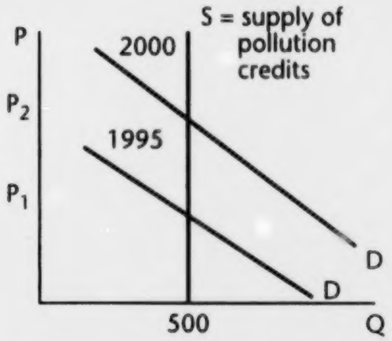
In this case, the business and its employees who work less bear some of the tax burden because output is reduced from Q_1 to Q_2. Consumers pay part of the burden because the price rises from P_1 to P_2.

5. According to the benefits-received theory, those who gain from the airport should pay for it. This could be done through landing fees for aircraft, taxes on passenger travel to and from the airport, fees for taxicabs picking up airport passengers, and taxes on hotel rooms adjacent to the airport. Application of the benefits-received theory is difficult, however, as many people other than those listed above will benefit. Under the ability-to-pay theory, the airport should be financed out of progressive income tax revenues, which collect the most money from those who are most able to pay. However, this will also reduce incentives and ability to produce.

6. Food and other necessities could be exempted from the tax. Because the poor spend a larger percentage of their income on necessities, this would make the sales tax less regressive. Also, luxuries could be taxed at a higher rate. However, determining what a "luxury" is can be difficult.

Answers to Sample Long Essay Questions

1.



a. The supply curve for pollution credits would be a straight line and perfectly inelastic because the city decided to set an upper limit on those rights at 500.

b. It would be the same—500 per year.

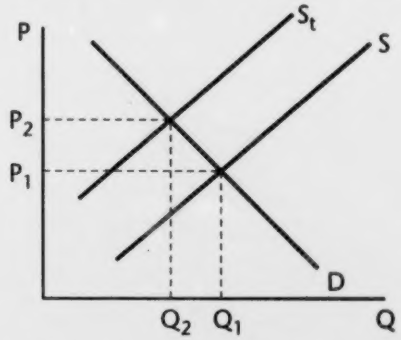
c. The demand curve in 1995 would assume the same downward slope as a demand curve for any other factor of production. Polluters therefore would have the choice of paying P_1 for their credits or finding ways of polluting less.

d. By 2000, we can assume that population growth and increased production by factories would increase the demand for pollution credits. Because they remain fixed by the city's edict, the price would rise.

e. The demand curve would move to the right, and the new equilibrium price would rise to P_2. The increased demand for a fixed supply would necessarily drive the price to a higher level.

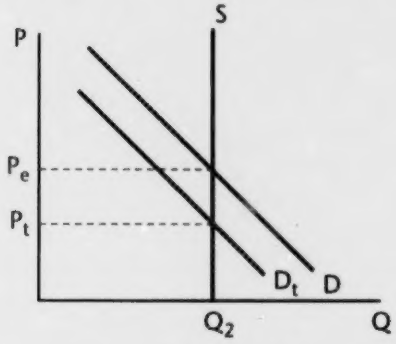
f. The costs to producers will almost always rise when government imposes an upper limit on pollution levels. Producers will have to cope with higher and higher prices for the right to dump waste, or they will have to explore new technologies to deal with it. Either way, their costs of production will go up in the short run (unless there is a technological breakthrough that costs very little to implement). A benefit to the public is a cleaner environment although goods will cost more.

2.



The incidence of the tax will be on both consumers and producers. The tax raises the costs of production which decreases supply. This decrease in supply causes the price to rise from P_1 to P_2. This higher price is paid by consumers. However, the quantity of Greebes purchased falls from Q_1 to Q_2. This decrease in the quantity of Greebes purchased means less after-tax revenue for the producers.

3.



In this case, the incidence of the tax is borne entirely by the seller. Because the amount of land is perfectly inelastic (fixed), the supply curve for land cannot shift. The price will remain at P_e. $P_t \times Q_2$ indicates the revenue for the landowners after the tax. All the tax did was to take some economic rent from landowners and move it to the government. This tax revenue is $P_e - P_t \times Q_2$. The landowner received $Pe \times Q_2$ before the tax and $P_t \times Q_2$ after the tax.

4. The ability-to-pay theory says that the tax rate should depend on a person's ability to pay the tax. The effective tax rate for higher incomes should be greater than for lower incomes.

ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

Large-income families should pay a higher tax rate than small-income families. The federal income tax meets the criteria of the ability-to-pay theory. There is an exemption for each family member, and the effective tax rate rises as income rises. Any progressive tax tends to meet the criteria of the ability-to-pay theory. Wealth should be considered in trying to adjust for ability to pay; differences in wealth are not always reflected fully in income.

The benefits-received theory of taxation holds that people who benefit from a government service should pay the tax. People who benefit more should pay higher taxes. The gasoline tax meets the criteria of the benefits-received theory. The gasoline tax funds highways. The more a person drives, the more gas he or she must buy and the more gas tax paid.

Visual 5.1

The Economic Functions of Government

1. Enforce laws and contracts.
2. Maintain competition.
3. Redistribute income—Provide an economic safety net.
4. Provide public goods:

   Nonexclusion.

   Shared consumption.
5. Correct market failures:
   a. Provide market information.
   b. Correct negative externalities.
   c. Subsidize goods with positive externalities.
6. Stabilize the economy:
   a. Fight unemployment.
   b. Encourage price stability.
   c. Promote economic growth.

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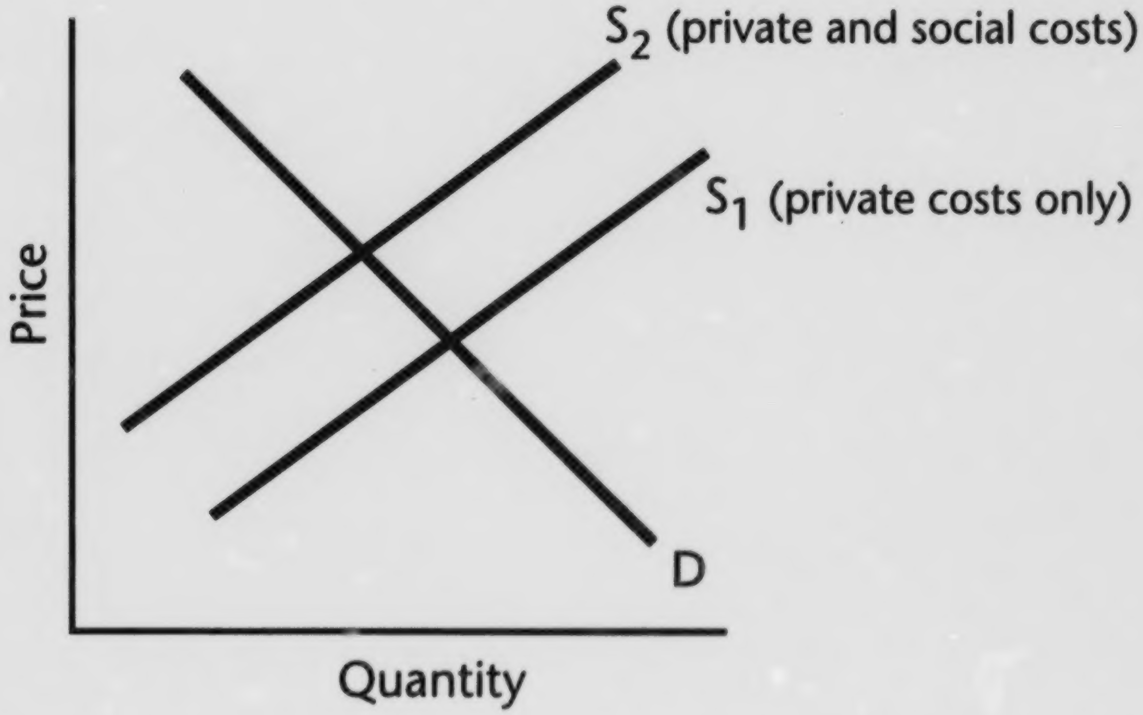
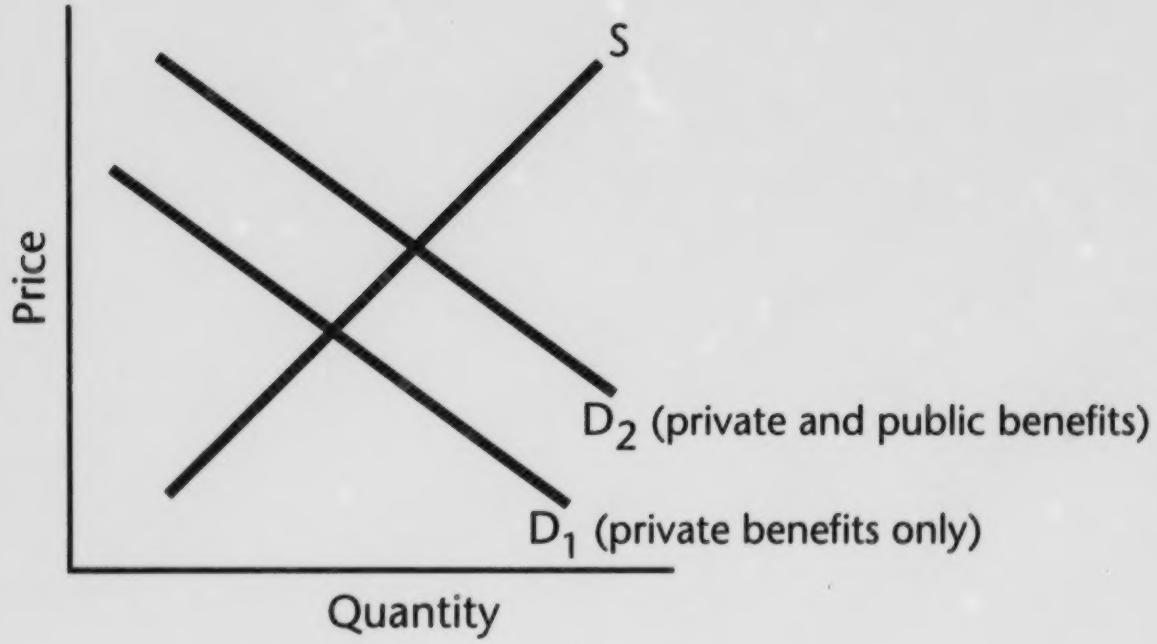
Visual 5.2

Illustrating a Negative Externality



Visual 5.3

Illustrating a Positive Externality



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Visual 5.4

Public-Choice Economics
or
Why Cats Don't Bark

1. Is it rational for government leaders to favor special interests over the general public interest?
   - Concentrated vs. special interests
   - Information costs

2. Why are politicians mainly in the middle of the road?
   - Median voter model of political behavior

3. Are people rational or irrational when they spend little time evaluating candidates before they vote and when they don't vote?

4. What is the effect of bureaucratic entrepreneurs on government?

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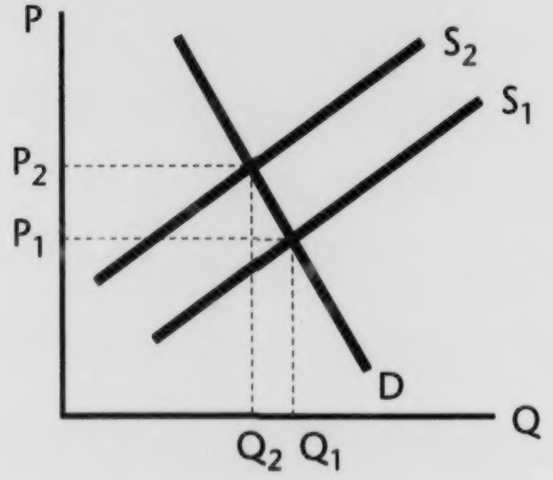
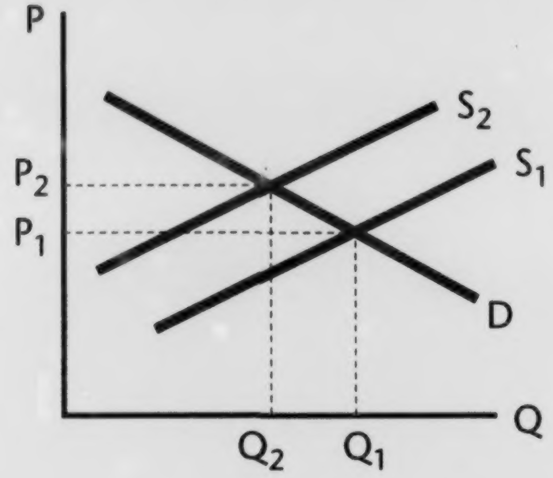
Visual 5.5

Tax Incidence and Elasticity and Demand





The more inelastic the demand for a good, the more the incidence of an excise tax can be shifted to the consumer.

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Advanced Placement Economics

Macroeconomics
Teacher Resource Manual

Outline for an Advanced Placement Macroeconomics Course

Unit 1. Basic Economic Concepts—8 days

- A. Scarcity: the nature of economic systems
- B. Production possibilities and alternative costs (opportunity costs)
- C. The functions of an economic system (what, how, and for whom) with applications to alternative economic systems
- D. Demand, supply, price determination

Unit 2. Measuring Economic Performance—13 days

- A. Circular flow of income
- B. Gross Domestic Product and National Income concepts
  - 1. Calculations
  - 2. How it is used
- C. Unemployment
  - 1. How it is measured
  - 2. Types of unemployment
- D. Inflation
  - 1. Measuring it through price indexes
  - 2. Nominal vs. real

Unit 3. Aggregate Demand and Aggregate Supply: Fluctuations of Outputs and Prices—20 days

- A. Aggregate supply
  - 1. Classical analysis
  - 2. Keynesian analysis
- B. Aggregate demand without money
  - 1. Circular flow
  - 2. Components of aggregate demand
  - 3. Multiplier
  - 4. Fiscal policy

Unit 4. Money, Monetary Policy, and Economic Stability—13 days

- A. Money and banking
  - 1. Definition of money
  - 2. Creation of money
  - 3. Tools of central bank policy
- B. Monetary policy and aggregate demand
- C. Monetarist/Keynesian controversy

Unit 5. Monetary and Fiscal Combinations: Economic Policy in the Real World—15 days

- A. A review of monetary and fiscal policy
- B. Why economists disagree
- C. Macroeconomic theories
  - 1. Classical

        2. Keynesian
        3. New classical economics
            a. Monetarism
            b. Supply shocks
            c. Rational expectations
    D. Exercises on monetary and fiscal policy combinations
    E. Tradeoffs between inflation and unemployment
        1. Phillips curve
        2. Long run vs. short run

Unit 6. The United States in a Global Economy—12 days

    A. Gains from trade (absolute and comparative advantage)
    B. Exchange in a multi-currency world
    C. Balance of payments
        1. Current account [net exports (X-M)]
        2. Capital account
        3. Government activity
    D. Adjustments in the foreign exchange market
    E. Government intervention
        1. Foreign exchange market
        2. Trade barriers
            a. Tariffs
            b. Quotas

Macroeconomics

Unit 1

Basic Economic Concepts

8 Days

Unit Overview

Although the microeconomic concepts covered in this unit account for only five to ten percent of the AP Macroeconomics Exam, a good foundation in microeconomics is essential if students are to understand the basic principles of macroeconomics. This is why the College Board recommends that microeconomics be taught before macroeconomics.

There are only four Activities in this opening unit. If you wish to expand the unit, use some of the Activities from Units 1 and 2 in the *Microeconomics Student Activities Book* and Visuals from the microeconomics section of this TRM.

The basic economic concepts may be tested within the context of macroeconomics. For example, production possibilities curves may be related to economic growth, and supply and demand curves may be related to the money market or to the effects of tariffs and quotas.

Textbook Assignments

Baumol and Blinder, Chapters 3, 4

McConnell and Brue, Chapters 2, 4

Miller, Chapters 2, 3

Planning Ahead

The Activities in Macro Unit 1 are the bare-bones minimum needed for the AP Macroeconomics Exam. Check the Activities in Microeconomics Units 1 and 2 if you wish to expand this unit. You certainly will want to add some general introductory material to the unit, but because teachers have different approaches, introductory material has not been built into this Unit 1 plan.

Unit 1 Activities

Activity 1	Scarcity, Opportunity Cost, and Production Possibilities Curves
Activity 2	Demand Curves, Moves Along Demand Curves, and Shifts in Demand Curves
Activity 3	Supply Curves, Moves Along Supply Curves, and Shifts in Supply Curves
Activity 4	Equilibrium Prices and Equilibrium Quantities

Sample Unit 1 Plan

Week 1	**Week 2**
1. Give a lecture on scarcity 2. Assign: Baumol, Chap. 3; McConnell, Chap. 2; Miller, Chap. 2.	1. Give a lecture on equilibrium. 2. Have students complete Activity 4. 3. Discuss the answers to Activity 4.
1. Use Micro Visual 1.2 to discuss production possibilities curves. 2. Assign Activity 1.	Review, using Sample Multiple-Choice and Essay Questions.
1. Discuss the answers to Activity 1. 2. Assign: Baumol, Chap. 4; McConnell, Chap. 4; Miller, Ch[illegible] 3.	Unit Test.
1. Give a lecture on demand. 2. Have students complete Activity 2. 3. Discuss the answers to Activity 2.	
1. Give a lecture on supply. 2. Have students complete Activity 3. 3. Discuss the answers to Activity 3.	

UNIT 1, LESSON 1

Scarcity, Opportunity Cost, and Production Possibilities Curves

Introduction and Description

In this lesson, students learn about scarcity and opportunity cost and use a production possibilities curve (PPC) to illustrate these concepts. Start with a lecture on scarcity and production possibilities curves. Then use Activity 1 to reinforce the lecture. If you need a more comprehensive treatment, use some of the Activities in Unit 1 of the *Microeconomics Student Activities Book*.

Objectives

1. Define *opportunity cost.*
2. Graph and interpret data.
3. Graph and distinguish among inverse, direct, and independent relationships.
4. Graph and distinguish between constant and variable relationships.
5. Identify the conditions that give rise to the economic problem of scarcity.
6. Construct production possibilities curves from sets of hypothetical data.
7. Analyze the significance of different locations on, above, and below a production possibilities frontier.
8. Compare and contrast the effects of societal priorities on the slope, outer limits, and operating points on the PPC.

Time Required

- Three class periods

Materials

1. Activity 1
2. *Microeconomics* Visual 1.2

Procedure

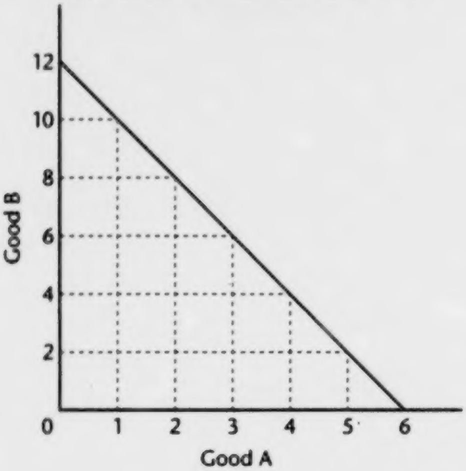
1. Give a lecture on scarcity.
   a. Wants are unlimited.
   b. Resources (land, labor, capital, entrepreneurship) are limited.
   c. There is a need to make decisions. The cost of choosing one good is the next best available option. This is called *opportunity cost.* In less technical terms, there is no such thing as a free lunch.
2. Use *Microeconomics* Visual 1.2 and make points such as the following about production possibilities curves:
   a. What are the tradeoffs involved?
   b. Why is a PPC concave or bowed out from the origin?
   c. What does a point inside the PPC indicate?
   d. What is an historic example of a point inside the PPC? (*the Great Depression of the 1930s*)
   e. What is the significance of a point outside the PPC?
   f. Under what conditions can a point outside the PPC be reached?
3. Have the students complete Activity 1.
4. Go over Activity 1. Consider these points when discussing the answers:
   a. The law of increasing opportunity cost is hard for students to grasp. If opportunity cost is constant or increasing for one of the goods, it is constant or increasing for both of the goods.
   b. The free good case is an exercise in graphic interpretation, which can be used to emphasize that there are very few free goods in the world.
   c. Decreasing opportunity cost is listed as a distractor but no production possibilities curves illustrating this are shown. Such a curve would be convex to the origin; a society would never operate on the curve because increasing returns over the entire output range would force production to one of the borders on the axis.

ACTIVITY 1 **ANSWER KEY**
Scarcity, Opportunity Cost, and Production Possibilities Curves

Scarcity necessitates choice. More of one thing means less of something else. The opportunity cost of using scarce resources for one thing instead of something else is often represented in graphical form as a production possibilities curve.

Part A.
Use *Production Possibilities Curves 1-3* to answer questions 1, 2, and 3. Fill in the answer blanks or cross out the incorrect words in parentheses.

Production Possibilities Curve 1



1. The economy represented in *Production Possibilities Curve 1* is currently producing 12 units of Good B and zero units of Good A. Therefore:

   a. The opportunity cost of increasing production of Good A from zero units to one unit is the loss of __2__ unit(s) of Good B. **[12 → 10 = –2]**

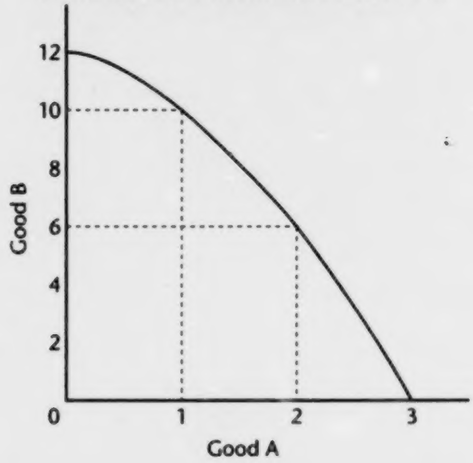
   b. The opportunity cost of increasing production of Good A from one unit to two units is the loss of __2__ unit(s) of Good B. **[10 → 8 = –2]**

   c. The opportunity cost of increasing production of Good A from two units to three units is the loss of __2__ unit(s) of Good B. **[8 → 6 = –2]**

   d. This is an example of *(constant/~~increasing~~/~~decreasing~~/~~zero~~)* opportunity cost for Good A.
   In terms of forgone units of Good B, it is always 1A = –2B.

ACTIVITY 1 ANSWER KEY continued

Production Possibilities Curve 2



2. The economy represented in *Production Possibilities Curve 2* is currently producing 12 units of Good B and zero units of Good A. Therefore:

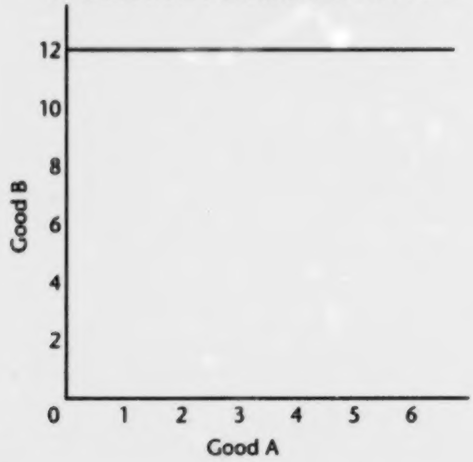
   a. The opportunity cost of increasing production of Good A from zero units to one unit is the loss of ___2___ unit(s) of Good B. **[12 → 10 = –2]**

   b. The opportunity cost of increasing production of Good A from one unit to two units is the loss of ___4___ unit(s) of Good B. **[10 → 6 = –4]**

   c. The opportunity cost of increasing production of Good A from two units to three units is the loss of ___6___ unit(s) of Good B. **[6 → 0 = –6]**

   d. This is an example of *(~~constant~~/increasing/~~decreasing~~/~~zero~~)* opportunity cost for Good A.
   In terms of forgone units of Good B.

Production Possibilities Curve 3



ACTIVITY 1 ANSWER KEY continued

3. The economy represented in *Production Possibilities Curve 3* is currently producing 12 units of Good B and zero units of Good A. Therefore:

   a. The opportunity cost of increasing production of Good A from zero units to one unit is the loss of __0__ unit(s) of Good B.

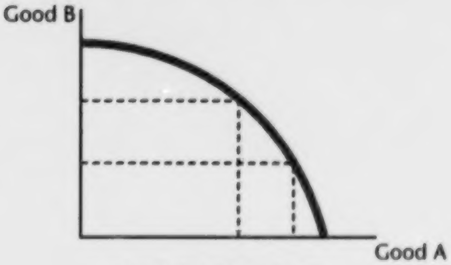
   b. The opportunity cost of increasing production of Good A from one unit to two units is the loss of __0__ unit(s) of Good B.

   c. The opportunity cost of increasing production of Good A from two units to three units is the loss of __0__ unit(s) of Good B.

   d. This is an example of *(~~constant/increasing/decreasing~~/zero)* opportunity cost for Good A.
   Good A is a "free good." You do not have to give up any Good B to get it.

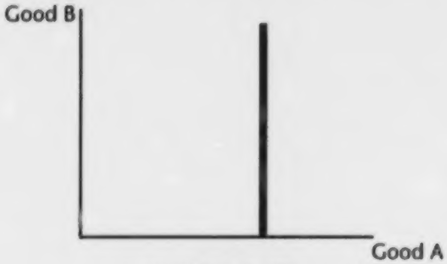
Part B.
Use the axes for *Production Possibilities Curves 4, 5,* and *6* to draw in the type of curve that illustrates the labels given below each axis.

Production Possibilities Curve 4



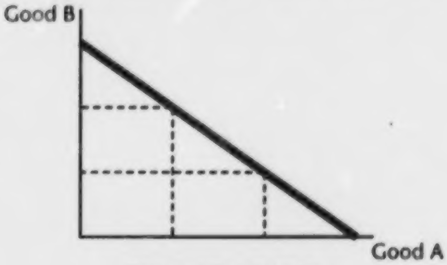
Increasing Opportunity
Cost per unit of Good B

Production Possibilities Curve 5



Zero Opportunity
Cost per unit of Good B
(Good B is a free good)

Production Possibilities Curve 6

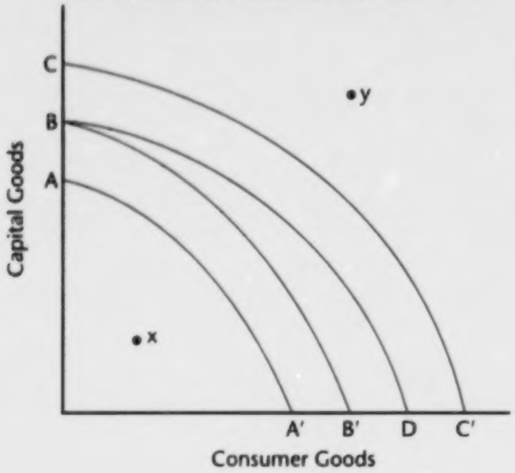


Constant Opportunity
Cost per unit of Good B

ACTIVITY 1 ANSWER KEY continued

Part C.
Study *Production Possibilities Curve 7* and use it to answer each of the questions that follow.

Production Possibilities Curve 7



1. If BB′ represents a country's current production possibilities curve, which would be its production possibilities curve if there were a major technological breakthrough in the consumer goods industry and the new technology were widely adopted? (Indicate the curve you choose with two letters.) **BD'**

2. If BB′ represents a country's current production possibilities curve, which would be its production possibilities curve if a new government that came into power forbade the use of automated machinery and modern production techniques in all industries? (Indicate the curve you choose with two letters.) **AA'**

3. If BB′ represents a country's current production possibilities curve, which would be its production possibilities curve if massive new sources of oil and coal were found within the economy and if there were major technological innovations in both sectors of the economy? (Indicate the curve you choose with two letters.) **CC'**

4. If BB′ represents a country's current production possibilities frontier, what conclusions can be drawn about the location of point *x*? (Write a brief statement.)
The economy is not fully utilizing existing resources and technology.

5. If BB′ represents a country's current production possibilities frontier, what can you say about a point like *y*? (Write a brief statement.)
Impossible to attain with existing resources and technology.

UNIT 1, LESSON 2

An Introduction to Supply and Demand

Introduction and Description

Supply and demand analysis is the heart of economics. This lesson covers determinants of demand, determinants of supply, and the interaction of supply and demand in determining relative prices and quantities. If you desire a more comprehensive treatment, use some of the Activities in Unit 2 of the *Microeconomics Student Activities Book.*

Objectives

1. List and explain the determinants of demand.
2. List and explain the determinants of supply.
3. Define *equilibrium.*
4. Graph a supply and demand schedule from data.
5. Determine what the equilibrium price and quantity will be when given the demand for and the supply of a good.
6. Explain why the price of a good and the amount of a good bought and sold in a competitive market will be the equilibrium price and quantity.
7. Differentiate between a *change in demand* and a *change in quantity demanded.*
8. Differentiate between a *change in supply* and a *change in quantity supplied.*
9. Given changes in supply and demand, explain which curve has shifted in which direction and why.

Time Required

- Three class periods

Materials

Activities 2, 3, and 4

Procedure

1. Give a lecture on demand.
    a. Why is the demand curve downsloping?
        (1) Explain the income and substitution effects.
        (2) Explain how diminishing marginal utility explains the shape of the demand curve.
    b. Illustrate the difference between a *change in demand* and a *change in quantity demanded.*
    c. Explain the determinants of demand and how they shift the demand curve.
        (1) Change in consumer tastes.
        (2) Change in income.
        (3) Change in the number of consumers (population).
        (4) Change in the prices of substitute and complementary goods.
        (5) Change in consumer expectations.
2. Have the students complete Activity 2, which illustrates the law of demand and distinguishes between changes in the demand curve and movements along the demand curve.
3. Discuss the answers to Activity 2.
4. Give a lecture on supply.
    a. Explain the difference between a change in supply and a change in quantity supplied.
    b. Explain the determinants of supply.
        (1) Changes in the prices of inputs.
        (2) Changes in technology.
        (3) Natural disasters and other events that cause a decrease in production.
        (4) Government policies such as excise taxes, tariffs, and quotas.
5. Have the students complete Activity 3, which illustrates the relationship between price and quantity supplied and shifts in the supply curve and movements along the supply curve.

6. Discuss the answers to Activity 3.
7. Give a brief lecture on equilibrium. Emphasize the reasons that equilibrium will occur where quantity supplied equals quantity demanded. Illustrate how a price higher than equilibrium results in surpluses while a price lower than equilibrium results in shortages.
8. Have the students complete Activity 4; discuss the answers.

ACTIVITY 2 **ANSWER KEY**

Demand Curves, Moves Along Demand Curves, and Shifts in Demand Curves

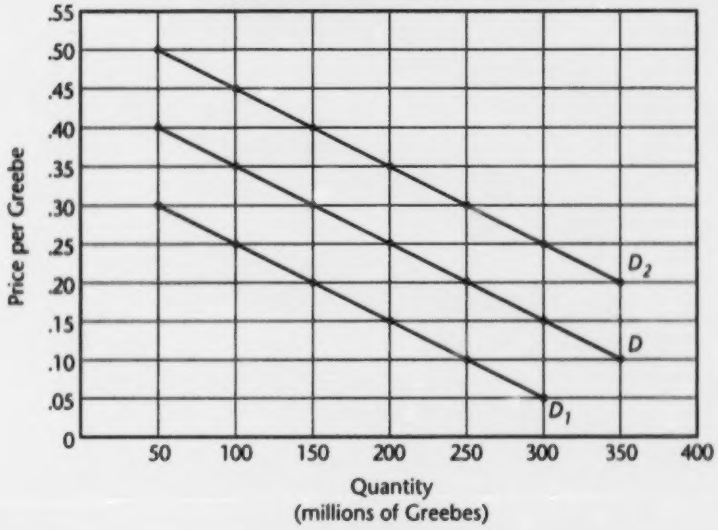
Part A.

The table *Demand for Greebes* shows the market demand for Greebes, a hypothetical product introduced to spare you the confusion of real-world associations. Study the data in the table, and plot the demand for Greebes on *Plotting Demand for Greebes*. Label the demand curve *D*, and answer the questions that follow.

Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.10	350
.15	300
.20	250
.25	200
.30	150
.35	100
.40	50

Plotting Demand for Greebes



Fill in the answer blanks or cross out the incorrect words in parentheses.

1. The data for demand curve *D* indicate that at a price of $.30 per Greebe, buyers would be willing to buy 150 million Greebes. Other things constant, if the price of Greebes increased to $.40 per Greebe, buyers would be willing to buy 50 million Greebes. Such a change would be a decrease in *(~~demand~~/quantity demanded)*. Other things constant, if the price of Greebes decreased to $.20, buyers would be willing to buy 250 million Greebes. Such a change would be called an increase in *(~~demand~~/quantity demanded)*.

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ACTIVITY 2 ANSWER KEY continued

2. Now, to take another example, let's suppose that there is a dramatic increase in federal income tax rates that reduces the disposable income of Greebe buyers. This change in the *ceteris paribus** conditions underlying the original demand for Greebes will result in a decrease in demand, and we would have a new set of data, such as that shown in the table *Decrease in Demand for Greebes*. Study the data in the new table, and plot the new demand curve for Greebes on *Plotting Demand for Greebes*. Label the new demand curve D_1 and answer the questions that follow.

Decrease in Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.05	300
.10	250
.15	200
.20	150
.25	100
.30	50

3. Comparing the new demand curve (D_1) with the old demand curve (D), we can say that a decrease in the demand for Greebes results in a shift of the demand curve to the *(~~right~~/left)*. Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(smaller/~~larger~~)* quantity, and at each of the possible quantities shown, buyers are willing to offer a *(~~higher~~/lower)* maximum price.

4. Now, let's suppose that there is a dramatic increase in people's "taste" for Greebes. This change in the *ceteris paribus* conditions underlying the original demand for Greebes will result in an increase in demand, and we would have a new set of data, such as that shown in the table *Increase in Demand for Greebes*. Study the data in the new table, and plot this demand for Greebes on the graph *Plotting Demand for Greebes*. Label the new demand curve D_2 and answer the questions that follow.

Increase in Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.20	350
.25	300
.30	250
.35	200
.40	150
.45	100
.50	50

5. Comparing the new demand curve (D_2) with the old demand curve (D), we can say that an increase in the demand for Greebes results in a shift of the demand curve to the *(right/~~left~~)*. Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(~~smaller~~/larger)* quantity, and at each of the possible quantities shown, buyers are willing to offer a *(higher/~~lower~~)* maximum price.

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* *ceteris paribus* means "other things being equal."

ACTIVITY 2 ANSWER KEY continued

Part B.
Now, the dog work over, see if you have the point by circling the letter of the answer you think is the one best alternative in each of the following multiple-choice questions.

1. Other things constant, which of the following would *not* cause a change in the demand (shift in the demand curve) for mopeds?

   a. A decrease in consumer incomes.

   [✓ b.] A decrease in the price of mopeds.

   c. An increase in the price of bicycles.

   d. An increase in people's tastes for mopeds.

2. "Rising oil prices have caused a sharp decrease in the demand for oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes this quotation:

   a. The quotation is correct—an increase in price always causes a decrease in "demand."

   b. The quotation is incorrect—an increase in price always causes an increase in "demand" not a decrease in "demand."

   [✓ c.] The quotation is incorrect—an increase in price causes a decrease in the "quantity demanded" not a decrease in "demand."

   d. The quotation is incorrect—an increase in price causes an increase in the "quantity demanded" not a decrease in "demand."

3. "As the price of domestic automobiles has inched upward, customers have found foreign autos to be a better bargain. Consequently, domestic auto sales have been slipping and foreign auto sales have been moving briskly." Using only the information in this quotation, and assuming everything else constant, which of the following best describes this statement?

   a. A shift in the demand curves for both domestic and foreign automobiles.

   b. A movement along the demand curves for both foreign and domestic automobiles.

   [✓ c.] A movement along the demand curve for domestic autos **[Higher price, less quantity demanded]** and a shift in the demand curve for foreign autos **[Change in underlying conditions (price of domestic autos)]**.

   d. A shift in the demand curve for domestic autos and a movement along the demand curve for foreign autos.

ACTIVITY 2 ANSWER KEY continued

4. A fellow student is heard to say the following: "Economic markets are like a perpetual seesaw. If demand rises, the price rises; if price rises, then demand will fall; if demand falls, price will fall; if price falls, demand will rise... and so on forever." Dispel your friend's obvious confusion (in no more than one short paragraph) below.
   This student is confusing a change in "demand" (shift in the curve) with a change in "quantity demanded" (move along curve.)
   The second phrase, "If price rises, then demand will fall," IS WRONG—the quantity demanded will fall assuming demand is not perfectly elastic. And since this is not a change in demand, the rest of the statement does not follow.

ACTIVITY 3 **ANSWER KEY**

Supply Curves, Moves Along Supply Curves, and Shifts in Supply Curves

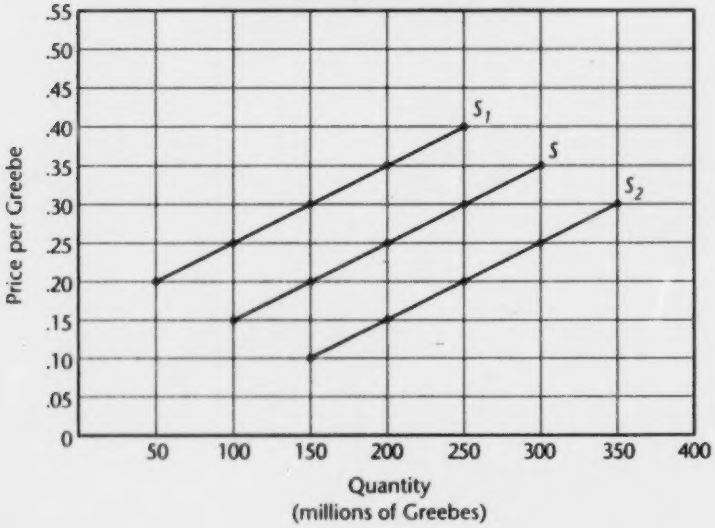
Long-run competitive market supply curves usually slope "up to the right," but not always. If each firm in the market could expand its output with a constant marginal cost, and if new firms could enter the market with exactly the same costs as the firms already in the market, the long-run supply curve would be a "perfectly elastic" horizontal line. But this is not likely in very many cases. Typically, firms in a competitive market experience increases in their marginal costs as output expands beyond a certain point, and firms entering a competitive market as price rises usually have higher costs than firms already in the market at lower prices. (If marginal cost continues to fall as output expands, only one firm would ever be in the market and, by definition, there could not be a competitive market supply curve.)

In this problem, we will assume that the long-run supply curve for Greebes is "typically" "upward sloping." Study the data in the table, *Supply of Greebes*, and plot the supply of Greebes on the graph *Plotting Supply of Greebes*. Label the supply curve *S*, and answer the questions that follow.

Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.15	100
.20	150
.25	200
.30	250
.35	300

Plotting Supply of Greebes



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ACTIVITY 3 ANSWER KEY continued

Part A.
Fill in the answer blanks or cross out the incorrect words in parentheses.

The data for supply curve *S* indicate that at a price of $.25 per Greebe, suppliers would be willing to offer **200** million Greebes. Other things constant, if the price of Greebes increased to $.30 per Greebe, suppliers would be willing to offer **250** million Greebes. Such a change would be an increase in *(~~supply~~/quantity supplied)*. Other things constant, if the price of Greebes decreased to $.20 per Greebe, suppliers would be willing to offer **150** million Greebes. Such a change would be called a decrease in *(~~supply~~/quantity supplied)*.

Now let's suppose that there is a dramatic increase in the price of several of the raw materials used in making Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in a decrease in supply, and we would have a new set of data, such as that shown in the table *Decrease in Supply of Greebes*. Study the data in the new table, and plot this supply of Greebes on *Plotting Supply of Greebes*. Label the new supply curve S_1 and answer the questions that follow.

Decrease In Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200
.40	250

Comparing the new supply curve (S_1) with the old supply curve (S), we can say that a decrease in the supply of Greebes results in a shift of the supply curve to the *(~~right~~/left)*. Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a *(smaller/~~larger~~)* quantity, and at each of the possible quantities shown, suppliers are willing to accept a *(higher/~~lower~~)* minimum price.

Now, to take another example, let's suppose that there is a dramatic decrease in the price of several of the raw materials used in making Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in an increase in supply, and we would have a new set of data, such as that shown in the table *Increase in Supply of Greebes*. Study the data in the new table, and plot this supply of Greebes on *Plotting Supply of Greebes*. Label the new supply curve S_2 and answer the questions that follow.

Increase In Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.10	150
.15	200
.20	250
.25	300
.30	350

ACTIVITY 3 ANSWER KEY continued

Comparing the new supply curve (S_2) with the old supply curve (S), we can say that an increase in the supply of Greebes results in a shift of the supply curve to the *(right/~~left~~)*. Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a *(~~smaller~~/larger)* quantity, and at each of the possible quantities shown, suppliers are willing to accept a *(~~higher~~/lower)* minimum price.

Part B.

Now, the dog work over, see if you have the point by circling the letter of the answer you think is the one best alternative in each of the following multiple-choice questions.

1. Other things constant, which of the following would *not* cause a change in the long-run supply of beef?

    [✓ a.] A decrease in the price of beef.

    b. A decrease in the price of cattle feed.

    c. An increase in the price of cattle feed.

    d. An increase in the cost of transporting cattle to market.

2. "Falling oil prices have caused a sharp decrease in the supply of oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes the quotation.

    a. The quotation is correct—a decrease in price always causes a decrease in "supply."

    b. The quotation is incorrect—a decrease in price always causes an increase in "supply," not a decrease in "supply."

    c. The quotation is incorrect—a decrease in price causes an increase in the "quantity supplied," not a decrease in "supply."

    [✓ d.] The quotation is incorrect—a decrease in price causes a decrease in the "quantity supplied," not a decrease in "supply."

ACTIVITY 4 **ANSWER KEY**

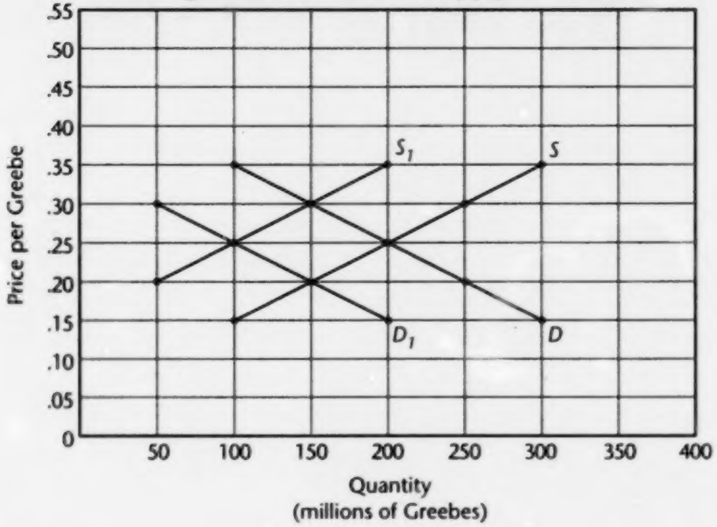
Equilibrium Prices and Equilibrium Quantities

The table *Demand for and Supply of Greebes* shows the demand for Greebes and the supply of Greebes. Plot these data on the graph *Plotting Demand for and Supply of Greebes*. Label the demand curve *D*, and label the supply curve *S*. Then answer the questions that follow.

Demand for and Supply of Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)	Quantity Supplied (millions of Greebes)
$.15	300	100
.20	250	150
.25	200	200
.30	150	250
.35	100	300

Plotting Demand for and Supply of Greebes



Part A.

Fill in the answer blanks or cross out the incorrect words in parentheses.

1. Under these conditions, competitive market forces would tend to establish an equilibrium price of $ .25 per Greebe and an equilibrium quantity of 200 million Greebes.
2. If the price currently prevailing on the market is $.30 per Greebe, buyers would want to buy 150 million Greebes, and sellers would want to sell 250 million Greebes. Under these conditions, competitive market forces would tend to cause the price to *(~~rise~~/fall)* to a price of $ .25 per Greebe. And at this new price, buyers would now want to buy 200 million Greebes, and sellers would now want to sell 200 million Greebes. Due to this change in *(price/~~underlying conditions~~)*, the *(~~demand~~/quantity demanded)* changed by +50 million Greebes, and the *(~~supply~~/quantity supplied)* changed by -50 million Greebes.

ACTIVITY 4 ANSWER KEY continued

3. If the price currently prevailing on the market is $.20 per Greebe, buyers would want to buy **250** million Greebes, and sellers would want to sell **150** million Greebes. Under these conditions, competitive market forces would tend to cause the price to *(rise/~~fall~~)* to a price of $ **.25** per Greebe. And at this new price, buyers would now want to buy **200** million Greebes, and sellers would now want to sell **200** million Greebes. Due to this change in *(price/~~underlying conditions~~)*, the *(~~demand~~/quantity demanded)* changed by **–50** million Greebes, and the *(~~supply~~/quantity supplied)* changed by **+50** million Greebes.

4. Now, suppose that a mysterious blight causes the supply schedule for Greebes to change to the following:

New Supply Schedule for Greebes

Price ($ per Greebe)	Quantity Supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200

Plot the new supply schedule on the graph *Plotting Demand for and Supply of Greebes* and label it S_1. Under these conditions, competitive market forces would tend to establish an equilibrium price of $ **.30** per Greebe and an equilibrium quantity of **150** million Greebes. Compared to the equilibrium price for question 1, we say that, due to this change in *(~~price~~/underlying conditions)*, the *(supply/~~quantity supplied~~)* changed, and both the equilibrium price and the equilibrium quantity changed. The equilibrium price *(rose/~~fell~~)* and the equilibrium quantity *(~~rose~~/fell)*.

5. Now with the supply schedule at S_1, suppose further that a sharp drop in people's incomes as the result of a nationwide depression causes the demand schedule to change to the following:

New Demand Schedule for Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)
$.15	200
.20	150
.25	100
.30	50

ACTIVITY 4 ANSWER KEY continued

Plot the new demand schedule on the graph *Plotting Demand for and Supply of Greebes* and label it D_1. Under these conditions, with the supply schedule at S_1, competitive market forces would tend to establish an equilibrium price of \$ __.25__ per Greebe and an equilibrium quantity of __100__ million Greebes. Compared to the equilibrium price in question 4, due to this change in *(~~price~~/underlying conditions)*, the *(demand/~~quantity demanded~~)* changed. The equilibrium price *(~~rose~~/fell)* and the equilibrium quantity *(~~rose~~/fell)*.

6. If market conditions were represented by D_1 and *S*, the equilibrium price would be \$ __.20__ per Greebe, and the equilibrium quantity would be __150__ million Greebes.

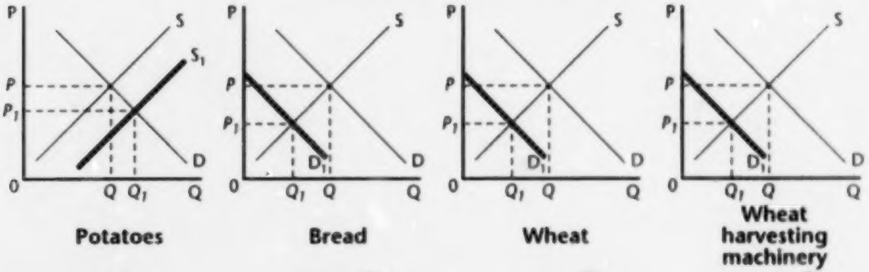
Part B.

The following questions refer to a group of related markets in the United States during a given long-run time period. Assume that the markets are perfectly competitive and that the supply-and-demand model is completely applicable. The diagrams show the supply and demand in each market before the assumed change occurs. Trace through the effects of the assumed change, other things constant. Work your way from left to right and ignore "feedback" effects. (Hint: Shift only one curve in each market.)

For each market below, draw whatever new supply and/or demand curves are needed, marking each new curve S_1 or D_1. Then circle the correct symbols under each diagram (↑ for increase, — for unchanged, ↓ for decrease). Remember, shift only one curve in each market.

1. Assume that a new fertilizer dramatically increases the number of potatoes that can be harvested with no additional labor or machinery. Also assume that this fertilizer does not affect wheat farming and that people are satisfied to eat either potatoes or bread made from wheat flour.

Effects of a New Fertilizer



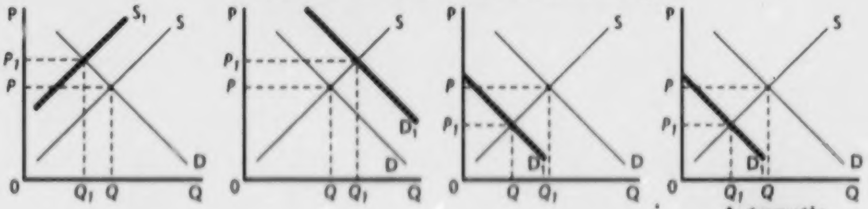
Potatoes Bread Wheat Wheat harvesting machinery

	Potatoes	Bread	Wheat	Wheat harvesting machinery
Demand:	↑ [✓ —] ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Supply:	[✓ ↑] — ↓	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Equilibrium quantity:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]

ACTIVITY 4 ANSWER KEY continued

2. Assume that a heavy frost destroys half the world's coffee crop and that people use more cream in coffee than they do in tea.

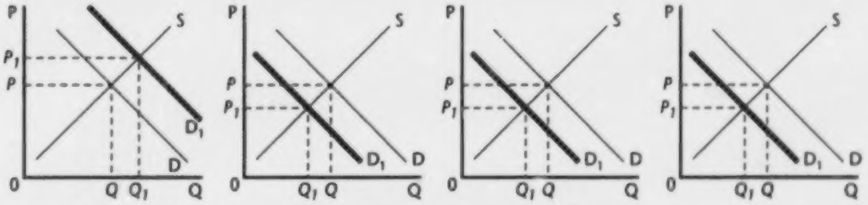
Effects of a Loss of Coffee Crop



	Coffee	Tea	Cream	Automatic coffee makers
Demand:	↑ [✓ —] ↓	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]
Supply:	↑ — [✓ ↓]	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	[✓ ↑] — ↓	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]
Equilibrium quantity:	↑ — [✓ ↓]	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]

3. Assume people's tastes change in favor of colored sports shirts, which are worn without neckties, and against white dress shirts, which are worn with neckties.

Effects of a Shift to Sports Shirts

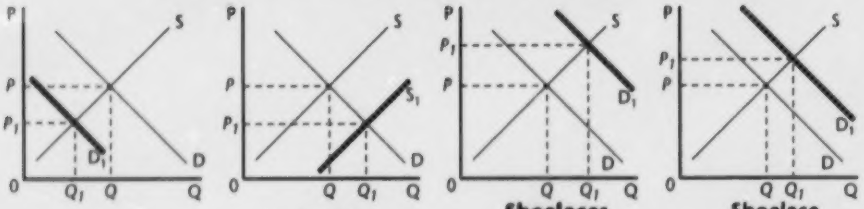


	Sports shirts	Dress shirts	Neckties	Tie clasps
Demand:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Supply:	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]
Equilibrium quantity:	[✓ ↑] — ↓	↑ — [✓ ↓]	↑ — [✓ ↓]	↑ — [✓ ↓]

ACTIVITY 4 ANSWER KEY continued

4. Assume people's tastes change and there is a decline in the demand for briefcases and luggage made out of leather. How would this affect the leather market and related markets? Underneath the two middle diagrams, write the names of the markets that relate leather to the shoelace packaging machinery. Draw the new curves and circle the appropriate symbols in all four markets.

Effects of Increased Demand for Leather Goods



	Leather	**Leather shoes**	**Shoelaces for leather shoes**	**Shoelace packaging machinery**
Demand:	↑ — [✓ ↓]	↑ [✓ —] ↓	[✓ ↑] — ↓	[✓ ↑] — ↓
Supply:	↑ [✓ —] ↓	[✓ ↑] — ↓	↑ [✓ —] ↓	↑ [✓ —] ↓
Equilibrium price:	↑ — [✓ ↓]	↑ — [✓ ↓]	[✓ ↑] — ↓	[✓ ↑] — ↓
Equilibrium quantity:	↑ — [✓ ↓]	[✓ ↑] — ↓	[✓ ↑] — ↓	[✓ ↑] — ↓

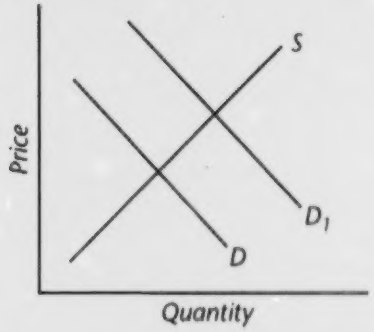
Answers to Sample Multiple-Choice Questions

1. d
2. b
3. d
4. b
5. a
6. b
7. d
8. c
9. c
10. e
11. b
12. d
13. b
14. a
15. c

Answers to Sample Short Essay Questions

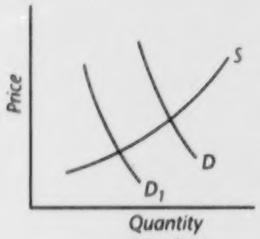
1. *False.* Unsold stocks of goods do not prove that scarcity does not exist, and the concept of scarcity is relevant to the study of modern economies such as that of the United States. Economic scarcity refers to the fact that there are not enough real productive resources to produce all goods and services desired at a price of zero. Prices greater than zero are simply one way of allocating or rationing scarce goods. Scarcity is relative, not absolute.

2. a.

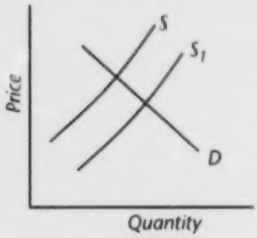


   b. An increase in demand has caused an increase in price and quantity supplied.

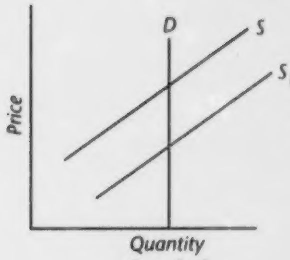
3.



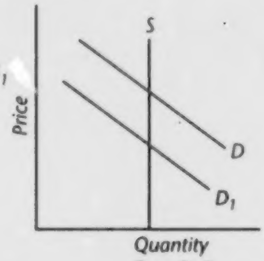
Graph A



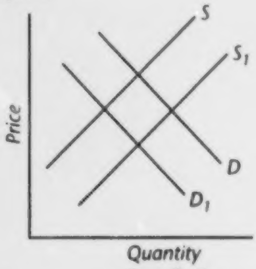
Graph B



Graph C or



Graph C or



Graph C

   a. Graph A shows a decrease in demand. Both price and quantity of wheat supplied decrease.
   b. Graph B shows an increase in supply. Price declines but the quantity of wheat demanded increases.
   c. There are three ways that price could decline and the quantity of wheat would stay the same. Demand could be perfectly inelastic and supply could increase. Supply could be perfectly inelastic and demand could decrease. Also supply could increase while demand decreases by a similar amount.

4. *False.* People with one million dollars cannot spend more than one million dollars. Even if people had as much money as they could use, the time to use it would be scarce.

Answers to Sample Long Essay Questions

1. a. Scarcity exists because there are limited resources to fulfill unlimited wants.

   b. What to produce and how much of each good or service to produce
   How to produce
   For whom to produce

   c. Tradition, command, and market

   d. Answers will vary. Here are some examples. Tradition: Certain jobs have been viewed as "women's work" or as "men's work." Command: Local governments build schools and require children to attend school. Market: The privately-owned music industry produces more rock and rap CD's and tapes when consumers show that they want and can pay for them.

2. Graph A assumes increasing costs. The shape of the curve is concave or bowed out. If you move from *a* to *e*, you must give up increasing amounts of guns to get more butter. This is what a production possibilities curve should look like.

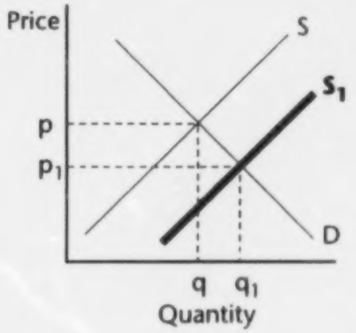
   Graph B assumes constant costs. As you go from *a* to *e*, the tradeoffs do not change.

   Graph C, a convex curve, assumes decreasing costs.

   Economic theory supports Graph A as a graph that correctly represents the law of increasing cost.

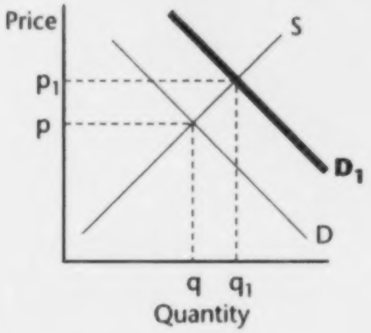
3. a. *Fresh Strawberries in the North*
   Other things constant, there is an increase in supply (as Northern growers enter the market).

   Market for
   Fresh Strawberries in the North



   b. *Christmas Cards*
   Other things constant, there is an increase in demand (due to a change in taste).

   Market for
   Christmas Cards



Macroeconomics

Unit 2

Measuring Economic Performance

13 Days

Unit Overview

The College Board indicates that eight to twelve percent of the Macroeconomics AP Examination will be on the measurement of economic performance. Questions could cover national income accounting, the measurement of inflation and unemployment, and the economic costs of inflation and unemployment. Students should know how the unemployment rate is measured and that there is a positive unemployment rate even during periods of "full employment." Students must also learn how price indexes work and how they are used to convert nominal values to real values. These concepts are particularly important because if students do not know how to measure economic performance, they will have difficulty in analyzing the effects of economic policies in later units.

The early lessons of this unit provide an overview of macroeconomics and show how macroeconomics affects people's lives. Because the detailed analysis of macroeconomics is tough going, students should see the goals of macroeconomic policy at the beginning of the course.

Textbook Assignments

Baumol and Blinder, Chapters 22, 23

McConnell and Brue, Chapters 7, 8

Miller, Chapters 7, 8

Planning Ahead

A big decision in this unit is how much detail to go into regarding national income accounting. It is unlikely that the AP Macroeconomics Test will require students to calculate Gross Domestic Product, Gross National Product, Net National Product, National Income, Personal Income, and Disposable Income. However, students do need to know the relationships among GDP, GNP, NNP, NI, PI, and DI and have an idea of the real-world magnitude of the figures. If you believe you can accomplish these goals without computing numbers, skip Activity 10. Activity 10 is tough going and, in addition, your textbook may cover this material differently from the method in Activity 10. Principles of economics textbooks differ significantly in the extent to which they equip students with some basic aspects of the National Income Accounts.

Because this unit uses economic statistics, it becomes outdated as soon as it is published. In Activity 14, space is provided to update these statistics. The handiest comprehensive source of current economic data is the *Economic Report of the President,* issued every February. In addition to an assessment of economic conditions by the President's Council of Economic Advisers, the report includes an appendix that contains more than 100 tables of statistical data. Other good statistical sources are the *Survey of Current Business*, the *Monthly Labor Review,* and reports issued by the Federal Reserve. There are also several computer databases that have good economic statistics.

Unit 2 Activities

Activity 5	Test of Macroeconomic Thinking
Activity 6	Understanding the Circular Flow of the Macroeconomy
Activity 7	Numbers That Make News
Activity 8	Measuring Economic Goals
Activity 9	All About GDP
Activity 10	GDP and Its Cousins
Activity 11	Price Indexes
Activity 12	Who Is Hurt and Who Is Helped by Inflation?
Activity 13	Types of Unemployment
Activity 14	The Business Cycle
Activity 15	Problems on Macroeconomic Indicators

Visuals

Visual 2.1	The Circular Flow of Resources, Goods, Services, and Money Payments
Visual 2.2	Adding Government to the Circular Flow
Visual 2.3	Broad Economic and Social Goals

Sample Unit 2 Plan

Week 1	**Week 2**	**Week 3**
1. Introduce macroeconomics. 2. Have students answer questions on Activity 5. 3. Discuss why each answer on Activity 5 is false. 4. Assign: Baumol, Chap. 22; McConnell, Chap. 7; Miller, Chap. 8.	1. Go over Activity 9. 2. Use the first 3 pages of Activity 10 to explain the calculation of the National Income Account, GDP, GNP, NNP, NI, PI, and DI.	1. Go over Activity 14. 2. Assign Activity 15 and Sample Multiple-Choice and Essay Questions.
1. Use Visual 2.1 to illustrate circular flow. 2. Use Visual 2.2 to add government to the circular flow. 3. Have students complete Activity 6. 4. Discuss Activity 6.	1. Have students complete Activity 10 in groups. 2. Discuss answers to Activity 10. 3. Brainstorm about strengths and weaknesses of GDP as a measure of well-being. 4. Assign: Baumol, Chap. 23; McConnell, Chap. 8; Miller, Chap. 7.	1. Go over Activity 15. 2. Review for test with sample questions.
1. Use Visual 2.3 to discuss broad economic and social goals. 2. Introduce students to statistics used in Activity 7. 3. Assign questions in Activity 7.	1. Give a lecture on price indexes. 2. Have students complete Activity 11. 3. Discuss Activity 11.	Unit Test.
1. Go over Activity 7. 2. Go through Activity 8 one section at a time.	1. Explain the differences between cost-push and demand-pull inflation. 2. Do a quick simulation to illustrate the effects of inflation. 3. Have students complete Activity 12. 4. Discuss Activity 12.	
1. Introduce the concept of national income accounting. 2. Give lecture on GDP. 3. Assign Activity 9.	1. Give a lecture on costs and types of unemployment. 2. Have students complete Activity 13. 3. Go over Activity 13. 4. Discuss phases of the business cycle. 5. Assign Activity 14.	

UNIT 2, LESSON 1

What Is Macroeconomics?

Introduction and Description

Students need a reason to believe macroeconomics is worthy of study. This lesson defines macroeconomics and offers a discussion of the consequences of macroeconomic failure.

The lesson also introduces the circular-flow diagram to students who have not studied microeconomics. The circular-flow diagram describes in a nontechnical way the major flows of goods, services, resources, and money. It is a model that illustrates how disturbances in those flows alter the levels of goods and services produced, employment, and income. This lesson teaches students to use the circular-flow diagram to explain macroeconomic activities.

Objectives

1. Understand why it is important to study macroeconomics.
2. Differentiate *macroeconomics* from *microeconomics*.
3. Analyze the components of the circular-flow diagram.
4. Use the circular-flow diagram to form hypotheses regarding the causes of changes in the levels of goods and services produced, incomes earned, and employment.
5. Analyze components of the circular-flow diagram.

Time Required

- Two class periods

Materials

1. Activities 5 and 6
2. Visuals 2.1 and 2.2

Procedure

1. Introduce macroeconomics by discussing some macroeconomic issues.
2. Use analogies to distinguish macroeconomics from microeconomics. Here is one suggested by Jerry McElroy, professor of economics at St. Mary's College–Notre Dame:*

   "In order to quickly demonstrate the difference between micro and macro theory in the first class lecture in Introductory Economics, I use a wrist watch. Micro analysis is analogous to examining the individual parts separately one at a time: the main spring, the various gears, hand armatures, and so on, are similar to the individual firm and individual consuming unit.

   "Macro, on the other hand, is analogous to examining how all the parts fit together to reflect the passage of time, and whether this output of the system (time measurement) is running too fast or too slow. In the same vein, macroeconomics considers the aggregate behavior of the individual units summed together, and focuses on whether the overall level of activity is on target, or inflationary or deflationary, and to what degree."
3. Give students Activity 5, *Test of Macroeconomic Thinking*. Veterans of AP Microeconomics might suspect another dirty trick, that all statements are false. They would be right.
4. Explain why each answer is false and the significance of each question to the study of macroeconomics.
5. Use Visual 2.1, the circular-flow diagram, to introduce the formal study of macroeconomics. This should be a review for students who have studied microeconomics.
6. Now elaborate on Visual 2.1 by having students trace a single product through the circular-flow diagram.
7. Use Visual 2.2 to add government to the circular-flow diagram. Be sure to make the main point that the circular-flow diagram provides a model to understand how real goods and services are produced and why employment and the price level change.
8. Reinforce the circular-flow model by having the students complete Activity 6.
9. Discuss the answers to Activity 6.

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*From Ralph T. Byrns and Gerald W. Stone, Editors, *Great Ideas for Teaching Economics*, Fifth edition (New York: HarperCollins, 1992).

ACTIVITY 5 **ANSWER KEY**
Test of Macroeconomic Thinking

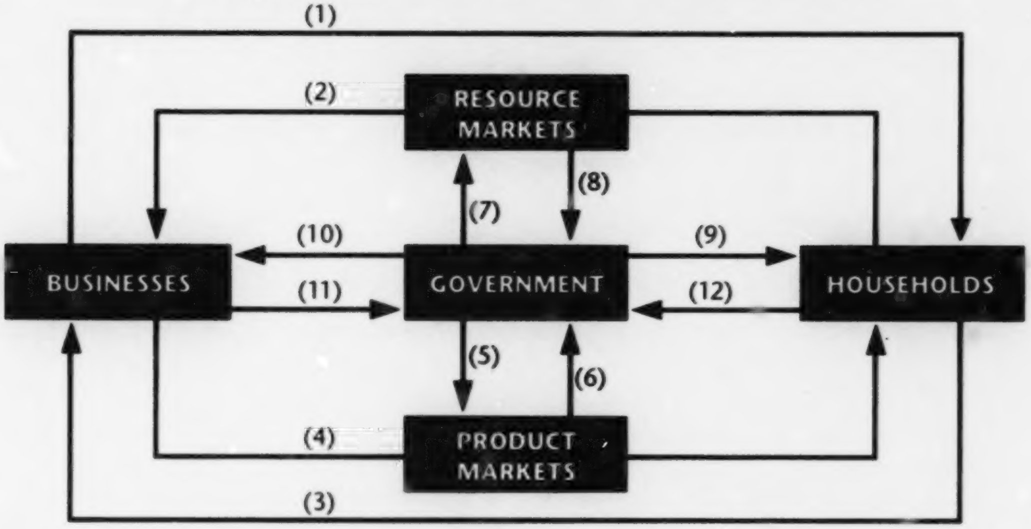
All answers are **false**. Following are the reasons they are false.

1. Scarcity is a relative concept. As our resources expand, so do our wants.
2. If resources are scarce and wants are unlimited, we would find new ways to use our resources. Military armaments can be justified more for reasons of defense than for economic reasons.
3. Money is not a resource. If it were, we would be better off if we made more money. In reality, this would cause inflation. Money is a tool that serves as a standard of value, a medium of exchange, and a store of value.
4. GDP is not primarily a measure of economic welfare nor does it show who gets the goods and services produced. GDP is a measure of economic activity.
5. Full employment does not mean zero unemployment. Economists believe frictional and structural unemployment are unavoidable. Unemployment is not zero when cyclical unemployment is zero. If we try to reduce the unemployment rate below full employment, we will have an inflationary economy.
6. If people believe inflation is inevitable, the belief creates inflationary expectations and a self-fulfilling prophecy. Inflation has been below three percent during much of the past 40 years, including the 1950s and 1990s.
7. Inflation is bad because it creates tensions between winners and losers and presents everyone with uncertainty about the future. The winners, such as debtors during a period of unexpected inflation, believe their wisdom caused them to gain. The losers, such as savers and lenders during a period of unexpected inflation, believe the system is to blame. According to J.M. Keynes, "There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction, and does it in a manner which not one man in a million is able to diagnose."
8. Most money consists of demand deposits (checking accounts) and is created by banks through lending.
9. The value of the dollar is determined by what it can buy. Gold is not used to determine the value of the U.S. dollar.
10. Economists believe government taxing and spending decisions affect the health of the economy. Fiscal policy is the specific creation of deficits or surpluses to affect the economy.
11. The Federal Reserve (the "Fed") controls the money supply and, in so doing, affects the economy. (The Chairman of the Fed is one of the most powerful people in the United States. Do your students know his name?) Bank deposits are insured by the FDIC.
12. Tariffs may save some jobs in protected industries, but they cause jobs to be lost in others. They also raise prices for consumers and interfere with the efficient allocation of resources.

ACTIVITY 6 **ANSWER KEY**
Understanding the Circular Flow of the Macroeconomy

The circular-flow diagram below includes business firms, households, and government (the public sector) as well as product and resource markets.

Circular Flow of Businesses, Households, and Government



Part A.

Supply a label or an explanation for each of the 12 flows in the model:

1. **Businesses pay costs for resources that become money income for households.**
2. **Households provide resources to businesses.**
3. **Household expenditures become receipts for businesses.**
4. **Businesses provide goods and services to households.**
5. **Government spends money in the product market.**
6. **Government receives goods and services from the product market.**
7. **Government spends money in the resource market.**
8. **Government receives resources from the resource market.**
9. **Government provides goods and services to households.**
10. **Government provides goods and services to businesses.**
11. **Businesses pay taxes to government.**
12. **Households pay taxes to government.**

ACTIVITY 6 ANSWER KEY continued

Part B.
Use the number that labels each flow on the diagram, *Circular Flow of Businesses, Households and Government,* to complete questions 1 and 2. Cross out the incorrect words in question 3.

1. If government wanted to expand output and employment in the economy, it would increase expenditure flows __5__ or __7__ **(either order)**, decrease net tax flows __11__ or __12__ **(either order)**, or do both.

2. If government wanted to increase the production of public (social) goods and decrease the production of private goods in the economy, it would increase flows __9__ and __10__ or __11__ **(any order)**.

3. If government wanted to redistribute income from high-income to low-income households, it would *(increase/~~decrease~~)* the net taxes (taxes minus transfers) paid by high-income households and *(~~increase~~/decrease)* the net taxes paid by low-income households.

UNIT 2, LESSON 2

Measuring Broad Economic and Social Goals

Introduction and Description

The Employment Act of 1946 and the Humphrey-Hawkins Act of 1978 commit the federal government to pursuing economic policies designed to promote high employment, price stability, and economic growth. Students should understand these and other broad economic and social goals of the United States and how we typically measure their achievement.

Objectives

1. Describe and discuss the broad economic and social goals of American society.
2. Describe the purpose of national income accounting.
3. Become familiar with the most important statistics that measure the U.S. economy.
4. Explain the importance of GDP as a measurement of economic production and growth.
5. Distinguish *real GDP* from *nominal GDP*.
6. Discuss the importance of per-capita GDP.
7. Describe the purpose of a price index.
8. Explain how a price index is calculated.
9. Explain how unemployment is measured in the United States.
10. Calculate unemployment and employment rates from appropriate data.

Time Required

- Two class periods

Materials

1. Activities 7 and 8
2. Visual 2.3

Procedure

1. Project Visual 2.3 and discuss some of the broad economic and social goals that are considered important in the United States today. These goals can be considered as criteria for evaluating the performance of the U.S. economic system. Some of the goals such as economic freedom and economic equity are difficult to measure. Others such as full employment, price stability, and economic growth are measured with the statistics presented in this unit. Some of these goals conflict and involve tradeoffs. Analyzing the goals helps people make more intelligent decisions by clarifying the nature of the tradeoffs among various goals. For a longer discussion of these goals, see Phillip Saunders' *A Framework for Teaching the Basic Concepts*, National Council on Economic Education, 1993.
2. Introduce students to economic statistics by going over "Numbers That Make News" in Activity 7.
3. Have students answer the questions from Activity 7.*
4. Go over the answers to Activity 7.
5. Have students begin Activity 8. Explain that in this lesson they will look at three important economic goals that are included among the broad economic goals of the United States, that is, goals that the majority of people support: full employment, price stability, and economic growth. Mention that there are other important economic goals, such as protecting the environment, promoting an equitable distribution of income, and promoting economic freedom. Have students read the Overview.
6. Call students' attention to the section entitled "Measuring the Achievement of Economic Goals." Work through the "Measuring Employment" section with the students. Have them answer the questions in Part A before going on.

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*Answers in Answer Key to activity 7 at the end of this lesson.

LESSON 2 continued

a. Point out that for question 1 both the unemployment rate and the employment rate were higher in 1990 than in 1950. Discuss how such a result could occur. It may seem paradoxical to students that both rates could be higher. To understand how this could happen, calculate the percentage increase in the numerators and the denominators of each equation shown earlier in the reading from 1950 to 1990. Since, for each equation, the numerators rose more than the denominators, both the employment rate and the unemployment rate rose. To understand *why* both rates went up, one must analyze the figures in more detail. In brief, the employment rate rose because many women entered the labor force and found jobs in great number. At the same time, the men in the labor force found jobs harder to get. Since the women largely took jobs that were not typically held by males, the new women workers did not, in general, displace men. The unemployment rate went up (1) because employment in industries that chiefly employ men—steel-making is a good example—declined, failed to increase, or increased very little and (2) because many teenagers entered the labor force and a large number of them did not find jobs.

b. Regarding question 2, ask students if the data on the national unemployment rate given in the table above reflect the extent of unemployment among a particular group in our society, such as teenagers. (No, the national unemployment rate is the average unemployment rate for all persons in the labor force. The unemployment rate for specific groups may be much higher or lower. In 1990, for instance, the unemployment rate for all teenagers [16-19 years old] was 15.5 percent; for black male teenagers it was 32.1 percent; and for black female teenagers it was 30.0 percent. In the same year, the unemployment rate for married men—black, white, and other—averaged 3.4 percent.)

7. Have students read through Part B, the "Measuring Price Changes" section of Activity 8 and work out the examples with them. Then have the students do the problems at the end of the section.

8. Have students read through the section on "Measuring Economic Growth" in Activity 8 and work out the examples in the text with them. Use the review questions at the end of the activity to evaluate the students' understanding of the topic.

ACTIVITY 7 **ANSWER KEY**
Numbers That Make News

1. Which two indexes described in this reading are used to measure inflation?
   Consumer Price Index **Producer Price Index**

2. Which index provides advance warning of future consumer price increases?
   Producer Price Index

3. True, false, or uncertain, and why? "Anyone not working is considered to be unemployed according to the government's unemployment statistics."
   ***False.* If they do not want to work or have not actively looked for work in the past four weeks, they are not considered to be part of the labor force.**

4. What does Gross Domestic Product measure?
   The total value of all final goods and services produced in the United States.

5. You are told that the Index of Leading Economic Indicators has gone down for three straight months. What is the significance of this?
   The economy may slow down six to nine months from then. You should be cautious in making any major career or financial move.

6. a. What is the prime rate?
   It is the interest rate banks charge their best commercial customers.

   b. If you were considering buying a new home, would you want the prime rate to be higher or lower? **lower**
   Why?
   A higher prime rate would probably mean mortgage rates are increasing, making the payments on a home mortgage loan higher.

7. You are planning a trip to Europe. Is a weak dollar good for you or bad for you? Explain.
   It would be bad for you. You would receive less foreign currency for your dollars, so foreign prices will be higher in dollar terms.

ACTIVITY 8 **ANSWER KEY**
Measuring Broad Economic Goals

Part A.
Measuring Employment

How well has the U.S. economy met the goal of full employment? Use the formulas just given to fill in the last three columns of the table, *Civilian Employment, 1950-1990.* (Answers for the year 1950 are supplied to guide you.)

Civilian Employment, 1950-1990

Year	Civilian non-institutional population, aged 16 and over	Civilian Labor Force (millions) Employed	Unemployed	Total	Unemployment rate	Employment rate
1950	105	59	3	62	4.8%	56.2%
1960	117	66	4	**70**	**5.7%**	**56.4%**
1970	137	79	4	**83**	**4.8%**	**57.7%**
1980	168	99	8	**107**	**7.5%**	**58.9%**
1990	188	117	7	**124**	**5.6%**	**62.2%**

1. Both the unemployment rate and the employment rate were higher in 1990 than in 1950. Can you explain how such a result could occur?

2. Do the data on the national unemployment rate given in the table *Civilian Employment, 1950-1990* reflect the extent of unemployment among a particular group in our society, such as teenagers aged 16-19?

Part B.
Measuring Price Changes

Prices of Three Goods Compared with Base Year

	Quantity bought in base year	Unit price in base year		Unit price in Year 1		Unit price in Year 2	
Whole pizza pie	30	$5.00	**150**	$7.00	**210**	$9.00	**270**
Prerecorded audiocassette	40	$6.00	**240**	$5.00	**200**	$4.00	**160**
6-pack of soft drinks	60	$1.50	**90**	$2.00	**120**	$2.50	**150**
Total			**480**		**530**		**580**

ACTIVITY 8 ANSWER KEY continued

Now try the following problems, based on the table *Prices of Three Goods Compared with Base Year.*

1. What is the cost of buying the base-year items in Year 2? **$580**
   (30 x $9) + (40 x $4) + (60 x $2.50)

2. What is the CPI for Year 2? **120.8**
   (580 ÷ 480) x 100 = 1.208 x 100

3. What was the percentage increase in prices from the base year to Year 2? **20.8%**
   120.8 – 100

4. In December 1990, the CPI was at 130.7, and in December 1991, the CPI was at 136.2. What was the percentage change in prices for this 12-month period? **4.21%**
   (136.2 – 130.7) ÷ 130.7 x 100 = 0.0421 x 100

Part C.
Measuring Economic Growth

In this example, the average standard of living fell even though economic growth was positive. Developing countries with positive economic growth but with high rates of population growth often experience this condition.

Now try these problems using the information in the table *Nominal and Real GDP*:

Nominal and Real GDP

	Nominal GDP	Price index	Population
Year 3	$5,000	125	11
Year 4	6,600	150	12

1. What is real GDP for Year 3? **$4,000**
   $5,000 x (100 ÷ 125)

2. What is real GDP for Year 4? **$4,400**
   $6,600 x (100 ÷ 150)

3. What is real GDP per capita for Year 3? **$363.64**
   $4,000 ÷ 11

4. What is real GDP per capita for Year 4? **$366.67**
   $4,400 ÷ 12

5. What is the rate of real economic growth between Years 3 and 4? **+10%**
   [($4,400 - $4,000) ÷ $4,000] x 100 = 0.1 x 100

6. What is the rate of real economic growth per capita between Years 3 and 4? **+0.83%**
   (*Hint:* Use per capita data in the economic growth rate formula.)
   [($366.67 - $363.64) ÷ 363.64] x 100 = 0.0083 x 100

UNIT 2, LESSON 3

GDP and Its Uses

Introduction and Description

GDP is the main measure of economic production and growth. This lesson introduces students to GDP and the other National Income and Product Accounts and gives them a perspective on how these accounts relate to one another. The questions on national income accounting on the AP Test should emphasize the nature and purpose of these accounts and should require the students to discuss the strengths and weaknesses of these accounts as measurement tools. Students will probably not have to calculate GDP, GNP, NNP, NI, and PI as they do in Activity 10. Therefore, the discussion of Activity 10 should go well beyond the arithmetic involved in the problems. It should emphasize why each of these accounts is important and in which ways each measurement is unique.

Objectives

1. Describe the purpose of national income accounting.
2. Define *Gross Domestic Product (GDP), Gross National Product (GNP), Net National Product (NNP), National Income (NI), Personal Income (PI),* and *Disposable Income (DI).*
3. Describe the relative magnitude of the components of GDP.
4. Distinguish those goods and services that are counted from those that are not counted as part of GDP.
5. When given data, compute GDP, GNP, NNP, NI, PI, and DI.
6. Compute GDP using both the income and expenditure approaches.
7. Evaluate the strengths and weaknesses of GDP as a measure of economic well-being.

Time Required

- Three class periods

Materials

Activities 9 and 10

Procedure

1. Tell the class that we need to measure the levels of real goods and services, employment, income, and prices in the economy before we can decide whether we should take actions to raise or lower them.
2. Discuss with students the fact that because of deductions it is impossible for them to make decisions to buy something or to save based only on the gross pay they receive at their jobs. Thus they must calculate their net pay after deductions before they can decide whether to buy something. Similarly, in the macroeconomy, we cannot make decisions based on gross measures of the total number of goods and services produced in the economy. Certain deductions must be made to derive a number on the basis of which we can make decisions about the desired levels of goods and services, employment, income, and prices in the economy. This lesson focuses only on the measures of real goods and services. Later lessons explain how employment and prices are measured.
3. In your lecture on GDP, cover points such as these:
    a. What is the purpose of GDP?
    b. What is a good definition of GDP?
    c. What is counted in GDP, and why?
    d. What is not counted in GDP, and why not?
    e. What are the components of GDP, and what are the relative magnitudes of Consumption, Investment, Government, and Net Exports?
    f. What problem might we have if there were no measurement like GDP?
4. Have the students complete Activity 9.
5. Go over the answers to Activity 9.*
6. Make a transparency of the first three pages of Activity 10 to explain:

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* See Answer Key

a. How GDP can be calculated by the output or flow of product method, GDP = C + I + G + (X – M), or by the income or earnings and costs approach (GDP = wages + interest + profits + rents + indirect business taxes + depreciation).

b. The difference between GDP and GNP.

c. The difference between gross investment and net investment.

d. How to calculate GDP, GNP, NNP, NI, and DI using both the expenditure and income approaches.

7. Now have the students look at the "Worksheet for Activity 10." Before they begin these calculations, be sure to consider the following points:

a. Your text may differ from this worksheet, but this exercise gets the job done. It is the general idea and not each minute detail that is important.

b. Corporate profits before taxes = corporate income taxes + dividends + undistributed corporate profits.

c. Gross Private Domestic Investment = expenditures on new structures (including new residential housing) + expenditures on new equipment + *changes* in business inventory.

d. Net Investment = Gross Investment – depreciation.

e. Government transfer payments are *not* considered in GDP but *are* part of Personal Income.

f. Government interest payments and consumer interest payments are considered to be transfers and not payments for the final goods and services measured in GDP. Even though they are not included in GDP, they are included in PI along with other transfer payments.

8. Because Activity 10 is difficult, it might be a good idea to have students do it in groups while you help them. They should use the "Worksheet for Activity 10" to do their calculations.

9. Go over the answers using a transparency of the "Worksheet for Activity 10" as a guide.

10. Urge students to brainstorm about weaknesses that may be inherent in GDP as a measure of well-being. Have a student record the weaknesses in a list on the board. If students fail to generate ideas on their own or stop before generating a sufficient list, ask them questions like the following to stimulate additional ideas:

a. Are there any goods and services not included in GDP that influence our well-being? (Goods and services produced in the home, illegal activities)

b. Are there any harmful effects from producing some goods and services? (e.g., pollution, disease)

c. Does GDP accurately reflect well-being when it includes goods and services that decrease the well-being of some people?

ACTIVITY 9 **ANSWER KEY**
All About GDP

Part A. Is This Counted as Part of GDP?
Which of the following are *included* and which are *excluded* in calculating this year's GDP? Explain your decisions.

1. A monthly check received by an economics student who has been granted a government scholarship. **No, transfer payment**
2. A farmer's purchase of a new tractor. **Yes, investment**
3. A plumber's purchase of a used truck. **No, used good**
4. The cashing of a U.S. government bond. **No, transfer payment**
5. The services of a mechanic in fixing the radiator on his car. **No, not a market activity**
6. A Social Security check paid by the government to a retired store clerk. **No, transfer payment**
7. An increase in business inventories. **Yes, investment**
8. The government's purchase of a new submarine for the Navy. **Yes, government expenditure**
9. A barber's income from cutting hair. **Yes, he is performing a service**
10. Income received from the sale of Nike stock. **No, purely financial transaction**

ACTIVITY 9 ANSWER KEY continued

Part B. GDP: Is It Counted and Where?

For each of the following items, write one of the following in the space provided:

C	if the item is counted as *consumption.*
I	if the item is counted as *investment.*
G	if the item is counted as *government.*
N	if the item is *not* counted in GDP.

__C__ 1. You spend $7.00 to attend a movie. **Both goods and services count as Consumption.**

__I__ 2. A family pays a contractor $100,000 for a house he built for them this year. **All construction counts as investment.**

__N__ 3. A family pays $75,000 for a house built three years ago. **Only current production counts.**

__C__ 4. An accountant pays a tailor $175 to sew a suit for her. **a service for a consumer**

__G__ 5. The government increases its defense expenditures by $1,000,000,000. **government expenditure on a good or service**

__N__ 6. The government makes a $90 Social Security payment to a retired person. **transfer payment**

__N__ 7. You buy General Motors stock for $1,000 in the stock market. **purely financial transaction**

__I__ 8. At the end of a year, a flour-milling firm finds that its inventories of grain and flour are $10,000 above the amount of its inventories at the beginning of the year. **net change in inventory**

__N__ 9. A homemaker works hard caring for her spouse and two children. **not a market transaction**

__I__ 10. Ford Motor Company buys new auto-making robots. **investment in machines**

__C__ 11. You pay $300 a month to rent an apartment. **a service**

__I__ 12. Apple Computer Company builds a new factory. **new plant and equipment**

__N__ 13. R.J. Reynolds Company buys control of Nabisco. **purely financial transaction**

__N__ 14. You buy a new Toyota that was made in Japan. **counted in Japan's GDP, not U.S. GDP. It is actually included in consumption and then subtracted from GDP as an import.**

__C__ 15. You pay tuition to attend college. **consumer expenditure on a service**

Part C. Why Are Things Counted or Not Counted in GDP?

1. We count only the final retail price of a new good or service in GDP. Why? **If we counted everything, there would be a lot of double counting.**
2. A purely financial transaction will not be counted in GDP. Why not? **It is not part of the nation's output or production of goods and services.**
3. When a homeowner does home improvement work, the value of the labor is not counted in GDP. Why not? **GDP counts only market transactions.**

ACTIVITY 10 **ANSWER KEY**
GDP and Its Cousins

Part B.

Compute the answers to the problems that follow.

1. You are given the following simplified and rounded data for a hypothetical economy.

	Billions of $
Personal Consumption Expenditures (C)	928
Gross Private Domestic Investment Expenditures for Structures, Equipment, and Inventory Change (I)	246
Government Purchases of Goods and Services (G)	288
Net Exports (Exports – Imports or X – M)	–3
Net Receipts of Factor Income from the Rest of the World	15
Consumption of Fixed Capital (depreciation)	140
Indirect Business Taxes (including statistical adjustments)	135

Compute the following:

a. Gross Domestic Product $ **1,459** billion
b. Gross National Product $ **1,474** billion
c. Net National Product $ **1,334** billion
d. National Income $ **1,199** billion

2. You are now given additional simplified and rounded data for this economy.

	Billions of $
Compensation of Employees (mostly wages and salaries, includes employer and employee Social Security taxes)	891
Proprietors' Income (adjusted)	115
Rental Income of Persons (adjusted)	16
Net Interest (does *not* include federal government interest payments, which are counted as transfer payments, or interest paid by persons)	72
Total Corporate Profits (before taxes) (adjusted)	105
Corporate Income Taxes	52
Dividends	30
Social Security Taxes	111
Government and Private Transfer Payments	168
Interest Paid by Persons	25
Personal Income Taxes	159

Compute the following:

a. National Income $ **1,199** billion
b. Personal Income $ **1,206** billion
c. Disposable Personal Income $ **1,047** billion
d. Personal Savings $ **94** billion

ACTIVITY 10 ANSWER KEY continued

Part C.
Answer the following questions. Use the Worksheet for Activity 10 on the following page.

1. Why can't one add up the value of sales for all producing units to arrive at national product? What must one add up instead?
   You would double count so you add up only the value added.

2. Explain the relationships among GDP, GNP, NNP, NI, PI, and DPI. For what different purposes might one be interested in each of these different totals?
   This is covered in the introduction to the lesson.

ANSWERS: WORKSHEET FOR ACTIVITY 10

GDP, GNP, NNP, and National Income (NI) can be obtained in two ways:

Flow of Product, "Money Spent"	(% of GDP)*
Consumption Expenditures (C)	928 (63.6)
Gross Private Domestic Investment (I)	246 (16.9)
Government Purchases of Goods & Services (G)	288 (19.7)
Net Exports (X–M)	–3 (–0.2)
Gross Domestic Product (GDP)	1,459 (100.0)
+ Net Receipts of Factor Income From the Rest of the World.	15 (1.0)
Gross National Product(GNP)	1,474 (101.0)
– Capital Consumption	140 (9.6)
Net National Product (NNP)	1,334 (91.4)
– Indirect Business Taxes	135 (9.3)
National Income (NI)	1,199 (82.2)

Earnings and Cost, "Money Received"	(% of GDP)	
Compensation of Employees	891 (61.1)	
Proprietors' Income (Adjusted)	115 (7.9)	
Rental Income of Persons (Adjusted)	16 (1.1)	
Net Interest	72 (4.9)	
Corporate Income Taxes	52	Total **105** Corporate Profits (Adj.)
Dividends	30	
Undistributed Corporate Profits	23	
National Income (NI)	1,199	
+ Indirect Business Taxes	135	
Net National Product (NNP)	1,334	
+ Capital Consumption	140	
Gross National Product (GNP)	1,474	
– Net Receipts of Factor Income From the Rest of the World.	15	
Gross Domestic Product (GDP)	1,459	

Undistributed corporate profits = total corp. profits – corp. income taxes –dividends

Personal Income (PI) can also be obtained in two ways:

TEAR DOWN		
National Income		1,199
– Corporate Income Taxes	52 (3.4)	
– Undistributed Corporate Profits	23 (1.6)	
– Social Security Taxes	111 (7.6)	186
		1,013
+ Government & Private Transfer Payments (168 (11.5)) & Interest Paid by Persons (25 (1.7))		193
Personal Income		1,206

BUILD UP	
PI = Compensation of Employees	891
Proprietors' Income (Adj.)	115
Rental Income of Persons (Adj.)	16
Net Interest	72
Dividends	30 (2.1)
Government & Private Transfer Payments (168 (11.5)) & Interest Paid by Persons (25 (1.7))	193
	1,317
– Social Security Taxes	111 (7.6)
Personal Income	1,206

Once we have Personal Income, obtaining Disposable Personal Income (DPI) and Personal Savings (S_p) is easy:

	Personal Income		1,206 (82.7)
	– Personal Income Taxes		159 (10.9)
	Disposable Personal Income		1,047 (71.8)
Personal Outlays	– Consumption Expenditures	928	
	– Interest Paid by Persons	25	953 (65.3)
	Personal Savings (S_p)		94 (6.4)

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* Students were not asked to provide percentages, which are additional information for teachers.

UNIT 2, LESSON 4

Measuring and Understanding Inflation

Introduction and Description

Along with unemployment, inflation is one of an economy's worst problems. Price indexes were introduced in Activity 8. This lesson provides more details on how a price index is constructed. It concludes by examining who is hurt and who is helped by inflation.

Objectives

1. Construct a price index from raw data.
2. Use a price index to calculate the rate of inflation.
3. Understand that changing the base year changes the numerical value of index numbers but does not change the relative (percentage) differences between index numbers.
4. Understand the limitations of the Consumer Price Index as a measure of inflation.
5. Distinguish between demand-pull and cost-push inflation.
6. Describe and analyze the reasons some groups are hurt while other groups benefit from unanticipated inflation.

Time Required

- Two class periods

Materials

1. Activities 11 and 12
2. Pieces of blue and green paper

Procedure

1. In a lecture on price indexes, explain the three most important: Consumer Price Index (CPI); Producer Price Index (PPI); and GDP Price Deflator, the index that is used to distinguish real GDP from nominal GDP.
2. Have the students complete Activity 11, which is designed to familiarize students with the construction of a price index, its interpretation, and its limitations. The activity is more relevant to fixed weight indexes such as the CPI than variable weight indexes such as the GDP Price Deflator.
3. Discuss the answers to Activity 11.*
4. Explain that when economists measure prices and find evidence of inflation, they endeavor to locate its cause. If it originates among buyers, it is called *demand-pull inflation*; if among sellers, it is called *cost-push inflation*. Explain the differences to students and/or have them read about the differences in their textbooks. Help students to recognize that when the sources of inflation differ, the solutions required to correct it differ as well.
5. Do this quick simulation to illustrate the effects of inflation:
   a. Persuade students that inflation acts like a tax on people hurt by it and like a tax rebate to people helped by it.
   b. Do this by dividing the class, arbitrarily assigning half as sellers and the other half to be buyers of a product. Cut slips of blue paper representing products in a quantity that is exactly equal to the number of slips of green paper, representing dollars you will place in circulation. Invite the buyers in Round 1 to exchange with the sellers at $1 per blue piece of paper until all green pieces of paper have been exchanged. Now inform the holders of the green paper money (the new buyers) that in Round 2 they are to exchange it for the blue paper, but this time at a cost of two green pieces of paper for every blue. Have all buyers exchange as many blue slips as possible.
   c. Ask the following: Who gained in Round 2 compared to Round 1? (New

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* See Answer Key

LESSON 4 continued

sellers) Who lost in Round 2? How much did they lose? What caused the gains and losses?

d. Make certain students recognize that the gainers ended up with a windfall and the losers suffered, as if taxed, through no fault of their own. Students might enjoy discussing in an open-ended way the fairness of inflation.

6. Inform students that economists study inflation to identify groups helped by it and groups hurt by it. Have students speculate and form hypotheses about the groups that are both helped and hurt by inflation. Record on the board students' hypotheses and why they think each group is helped or hurt.
7. Discuss who is helped and who is hurt by inflation.
8. Have the students complete Activity 12.
9. Go over the answers to Activity 12.*

* See Answer Key

ACTIVITY 11 **ANSWER KEY**
Price Indexes

There is more than one method of constructing a price index. The easiest to understand is probably the weighted average method explained in this Activity. This method compares the total cost of a fixed market basket of goods in different years. The total cost of the market basket is weighted by multiplying the price of any item in the market basket by the number of units of this item that are included in the market basket. The cost of the basic market basket in the current year is then expressed as a percentage of the cost of the basic market basket in a given base year using this formula:

$$\text{Index Number} = \frac{\text{Current Year Cost}}{\text{Base Year Cost}} \times 100$$

(The multiplication by 100 converts the raw numbers to a percentage basis, so an index number can be defined as a percentage of the base year. The base year always has an index number of 100 since the current year cost and the base year cost of the market basket are the same in the base year.)

Using this information, let us now construct a price index. Fill in the blanks in the table *Constructing a Price Index*. (Does the market basket listed in this table closely parallel your own personal spending pattern?)

Constructing a Price Index

Basic Market Basket Item	No. of Units	Year 1 Price per Unit	Yr. 1 Cost of Market Basket	Year 2 Price per Unit	Yr. 2 Cost of Market Basket	Year 3 Price per Unit	Yr. 3 Cost of Market Basket
Bread	5 Loaves	$.50	$2.50	$1.00	$5.00	$1.00	**$5.00**
Cheese	2 Lbs.	1.50	3.00	2.00	**$4.00**	2.50	5.00
Blue jeans	1 Pair	12.00	12.00	15.50	15.50	15.00	**$15.00**
Gasoline	10 Gals.	1.25	12.50	.75	**$7.50**	1.00	10.00
Textbook	1 Book	10.00	10.00	18.00	18.00	25.00	25.00
Total Expenditure			$40.00		$50.00		**$60.00**

1. We now have the information needed to construct a price index. The first step is to pick a base year and apply the formula. If Year 1 is selected as the base year, the index number for year one is ($40/$40 x 100 = 100). The index number for Year 2 is ($50/$40 x 100 = 125), and the index number for Year 3 is ($ **60** /$40 x 100 = **150**).

2. These index numbers indicate that there was a 25% increase in prices between Year 1 and Year 2.
   a. What is the percentage increase between Year 1 and Year 3? **50%**
   b. What is the percentage increase between Year 2 and Year 3? **20%**

ACTIVITY 11 ANSWER KEY continued

We need not have chosen Year 1 to be our base year. In order to determine if our choice of base year influenced the results we obtained, let's use Year 2 as our base year and recompute both the index numbers and the percentage changes between years.

Changing the Base Year of a Price Index

YEAR	Index Numbers (Year 2 = Base)	Percentage Change In Prices (Calculated by using changes in index numbers)
Year 1	$40/$50 x 100 = 80	Between Yr. 1 & Yr. 2 20/80 x 100 = 25%
Year 2	$50/$50 x 100 = 100	Between Yr. 2 & Yr. 3 **20** /100 x 100 = **20** %
Year 3	$ **60** /$ **50** x 100 = **120**	Between Yr. 1 & Yr. 3 40/80 x 100 = 50%

3. Do the index numbers change when the base year is changed from Year 1 to Year 2? **Yes**

4. Does the percentage change in prices between years change when the base year is changed from Year 1 to Year 2? **No** Why or why not?
Changing base years does not change the relative (or percentage) cost of the market baskets.

5. Would the price index numbers you have computed above change if a different set of expenditure patterns were selected for weighing? Why?
Yes. The overall index number depends on the weights given the various items in the market basket. It is very unlikely that changing weights would cancel out and leave the overall index number unchanged.

6. Under what conditions would each price index number computed above be a cost-of-living index? Under what conditions would it not be a cost-of-living index?
It would be a cost-of-living index only if one consumes exactly the same goods in exactly the same amounts as those shown in the market basket. It would not be a cost-of-living index if one consumed different goods or the same goods in different amounts.

7. a. Would each price index number computed above be accurate if the quality of the goods in the basic market basket changed?
No. There is no accurate way to determine how much of a change in price might be due to a change in quality in many (most) cases.

   b. How does one know if the quality of a product changes, for the better? For the worse?
   If quality were to improve, the index number would overstate the change in prices. If quality were to worsen, the index number would understate the change in prices.

ACTIVITY 12 **ANSWER KEY**

Who Is Hurt and Who Is Helped by Inflation?

Describe groups that are hurt by inflation and groups that benefit from inflation.
Circle:

H if the person or group is *hurt* by inflation.

G if the person or group *gains* from inflation.

U if it is *uncertain* if the person or group is affected by inflation
or if the effects are unclear.

Then explain why you answered as you did.

1. Banks extend many fixed-rate loans.

   [✓ H] G U Why? **The bank is paid back with inflated money, which buys less.**

2. A farmer buys machinery with a fixed-rate loan to be repaid over a ten-year period.

   H [✓ G] U Why? **The farmer pays back the loan with cheaper money.**

3. Your family buys a new home with an adjustable-rate mortgage.

   H G [✓ U] Why?
   During inflation, nominal interest rates rise. If the real interest rate (the interest rate after inflation is deducted) rises, the family will be hurt. If the real interest rate falls, the family will be helped.

4. Your savings from your summer job are in a savings account paying a fixed rate of interest.

   [✓ H] G U Why?
   Inflation makes the dollars worth less, and you cannot take advantage of higher nominal interest rates, which would rise with inflation. Even if you could switch accounts, the rise in rates should come after the increase in inflation.

5. A widow lives entirely on income from fixed-rate corporate bonds.

   [✓ H] G U Why?
   For the same reasons as question 4. If interest rates rise, the widow will have to sell the bond for less than she paid for it or hold it to maturity.

6. A retired couple lives entirely on income from a pension the woman receives from her former employer.

   H G [✓ U] Why?
   If the couple do not have a cost-of-living allowance (COLA), they will be hurt. If they do have a COLA, they may not be hurt.

7. A retired man lives entirely on income from Social Security.

   H G [✓ U] Why?
   Social Security does have a COLA, but it is limited. A large increase in the rate of inflation would hurt him.

ACTIVITY 12 ANSWER KEY continued

8. A retired bank official lives entirely on income from stock dividends.

   [✓ H] G U Why?
   Stock dividends usually increase with inflation while bond interest payments are fixed.

9. The federal government has a $5,000,000,000 debt.

   H [✓ G] U Why?
   This debt will be paid back with cheaper money.

10. A firm signs a contract to provide maintenance services at a fixed rate for the next five years.

    [✓ H] G U Why? **Costs will go up, but income will not.**

11. A state government receives revenue mainly from a progressive income tax.

    H [✓ G] U Why?
    Income increases during inflation, and this will increase marginal tax rates.

12. A local government receives revenue mainly from fixed-rate license fees charged to businesses.

    [✓ H] G U Why? **Tax revenues will not increase, but government costs will.**

13. Your friend rents an apartment with a three-year lease.

    H [✓ G] U Why? **Particularly if there is no change in rent paid.**

14. A bank has loaned millions of dollars for home mortgages at a fixed rate of interest.

    [✓ H] G U Why?
    If the fixed rate of interest is not at or above the inflation rate, the bank will be hurt because borrowers will pay the loan back with cheaper money.

15. Parents are putting savings for their child's college education in a bank savings account.

    [✓ H] G U Why?
    Bank savings accounts rarely keep ahead of inflation. If the interest rate is not above the inflation rate, they will be hurt. Stocks can be a better choice.

16. What conclusions can you draw about who is helped and who is hurt by inflation?
    Debtors and owners of real assets such as real estate are helped. Lenders and savers are hurt.

17. If you were certain that the inflation rate would be ten percent a year for the next ten years, how might your behavior change?
    You would use debt to purchase real assets like houses, land, buildings, gold, etc., particularly if you could borrow at interest rates that did not reflect the higher inflation.

UNIT 2, LESSON 5

Unemployment and the Business Cycle

Introduction and Description

Unemployment can result from decreases in output and from increases in the labor force relative to the number of workers needed. It is a major focus of macroeconomics because it represents unused resources that could be used to produce additional goods and services. Unemployment is affected by the business cycle, the economic ups and downs over the years. The long-term trend of economic activity in the United States has been upward. This trend has not been steady but has been characterized by periods of rapid economic expansion in some years and by periods of falling output and rising unemployment in other years. In this lesson, students are introduced to the business cycle, its causes, and its relationship to inflation and unemployment.

Objectives

1. Describe the four types of unemployment and explain how they differ.
2. Analyze some of the causes of frictional, cyclical, structural, and seasonal unemployment.
3. Describe and evaluate some of the economic and noneconomic consequences of unemployment.
4. Describe the phases of a business cycle.
5. When given data, identify the phases of the business cycle.

Time Required

- Two class periods

Materials

Activities 13 and 14

Procedure

1. Introduce the study of unemployment by informing students that it is another important variable, in addition to GDP and inflation, on which macroeconomics focuses. Explain that economists focus their attention directly on unemployment and only indirectly on employment because unemployment represents unused resources.
2. Review the ways unemployment and employment are measured. Students learned this in Activity 8.
3. Show students that some groups have more unemployment than others. Share the latest unemployment statistics with them and have them speculate on the causes of unemployment.
4. Give a lecture on the types of unemployment.
5. Have students complete Activity 13.
6. Discuss the answers to Activity 13.
7. Now put all the material together in explaining the business cycle. Have students read the first page of Activity 14. Go over the drawing of a business cycle and relate it to levels of unemployment, inflation, and real GDP.
8. Have the students answer the questions on Activity 14.
9. Discuss the answers to Activity 14.

ACTIVITY 13 **ANSWER KEY**

Types of Unemployment

There are four types of unemployment.

- *Frictional unemployment* includes people who are temporarily between jobs. They may have quit one job to find another, or they could be trying to find the best opportunity after graduating from high school or college.
- *Cyclical unemployment* rises in a recession. For example, it may be caused by too little spending in the economy. People are not buying many goods and services, so workers are laid off.
- *Structural unemployment* involves mismatches between job seekers and job openings. Unemployed people who lack skills or have a poor education are structurally unemployed.
- *Seasonal unemployment* affects workers who have worked during the past year but are unemployed during other parts of the year due to changes in the weather.

For each of the following situations, put the appropriate letter before the example.

F if it is an example of *frictional unemployment*.
C if it is an example of *cyclical unemployment*.
St if it is an example of *structural unemployment*.
S if it is an example of *seasonal unemployment*.

S 1. A Wisconsin construction worker cannot find work in the winter.
C 2. A steelworker is laid off because of a long recession.
F 3. A computer programmer quits her job in Chicago to look for a new job in San Diego.
C 4. A store clerk loses her job because sales are slow during a business slump.
St 5. A high school dropout applies for several jobs but is told each time that he is not qualified.
F 6. An unemployed college senior is looking for her first job.
St 7. An unemployed auto worker has been replaced by a robot.
F 8. A person rejects a job offer because the wage is too low.

ACTIVITY 14 **ANSWER KEY**
The Business Cycle

1. The table *The U.S. Economy, from 1970* contains information for the U.S. economy from 1970 through 1991. For each year, first identify whether the economy was in an expansionary (*E*) or a contractionary (*C*) phase. Then, go back and pick out the years that correspond to a business-cycle peak and mark them with a (*P*) and the years that correspond to a trough and mark them with a (*T*).

The U.S. Economy, from 1970

Year	*Real GDP in 1987 dollars (billions)*	*% change from previous year*	*Civilian unemployment rate*	*Inflation rate CPI Dec. to Dec.*	*Phase of the business cycle*
1970	2,873.9	0.0	4.9	5.6	C,T
1971	2,955.9	2.9	5.9	3.3	E
1972	3,107.1	5.1	5.6	3.4	E
1973	3,268.6	5.2	4.9	8.7	E,P
1974	3,248.1	–0.6	5.6	12.3	C
1975	3,221.7	–0.8	8.5	6.9	C,T
1976	3,380.8	4.9	7.7	4.9	E
1977	3,533.3	4.5	7.1	6.7	E
1978	3,703.5	4.8	6.1	9.0	E
1979	3,796.8	2.5	5.8	13.3	E,P
1980	3,776.3	–0.5	7.1	12.5	C,T
1981	3,843.1	1.8	7.6	8.9	E,P
1982	3,760.3	–2.2	9.7	3.8	C,T
1983	3,906.6	3.9	9.6	3.8	E
1984	4,148.5	6.2	7.5	3.9	E
1985	4,279.8	3.2	7.2	3.8	E
1986	4,404.5	2.9	7.0	1.1	E
1987	4,539.9	3.1	6.2	4.4	E
1988	4,718.6	3.9	5.5	4.4	E
1989	4,838.0	2.5	5.3	4.6	E
1990	4,877.5	0.8	5.5	6.1	E,P
1991	4,821.0	–1.2	6.7	3.1	C
1992			7.4		
1993					
1994					
1995					
1996					
1997					
1998					
1999					

SOURCE: *1993 Economic Report of the President*, U.S. Government Printing Office, Washington, DC.

ACTIVITY 14 ANSWER KEY continued

2. How many business cycles did the U.S. economy have between 1970 and 1991?
Four cycles

3. In how many years was output expanding? **16**

4. In how many years was output contracting? **5**

5. What economic expansionary period looks best to you? Why?
1983-1990 was the longest period of expansion.

6. What economic contraction/recession looks worst to you? Why?
Both the 1974-75 and the 1982 recessions were very serious. The 1982 recession was deeper, but the 1974-75 recession was longer.

7. During years in which real GDP fell, what happened to the unemployment rate compared with the previous year? Why?
The unemployment rate rose during the years in which real GDP fell. As less output was being produced, workers were laid off, and the unemployment rate rose.

8. Look at the unemployment rate in years corresponding to a business-cycle peak. Why do you think there was still some unemployment in those years?
The unemployment rate never falls to zero because there are always some workers who are voluntarily between jobs or who are looking for work for the first time. This type of unemployment is called *frictional unemployment*. Other workers lack the skills to take the jobs available. This category of unemployment is called *structural unemployment*. Unemployment that varies with the business cycle is called *cyclical unemployment*.

9. Based on the years 1970-1991, how does the rate of inflation correspond with the business cycle?
The rate of inflation seems less correlated with the business cycle than does the rate of unemployment. The rate of inflation usually rises during an economic expansion and into the beginning of a recession and then falls as the recession deepens.

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UNIT 2, LESSON 6

Analyzing Macroeconomic Indicators

Introduction and Description

This is a culminating activity requiring students to apply their knowledge of macroeconomic measurements and indicators. The students should have all the information necessary to answer these questions.

Objectives

1. Using their knowledge of economic indicators, analyze a variety of situations.
2. Synthesize their knowledge of macroeconomic indicators.

Time Required

- One class period

Materials

Activity 15

Procedure

1. Assign Activity 15 as homework, or have the students complete Activity 15 in groups.
2. Go over the answers to Activity 15.

ACTIVITY 15 **ANSWER KEY**

Problems on Macroeconomic Indicators

Answer the questions and briefly explain your answers on a separate sheet of paper.

1. **Ellen is incorrect. If more people come into the labor force and most of them do not find jobs, both the employment and unemployment rates will rise.**
2. ***False*. GDP measures a stream of production or income. Wealth is a concept that includes the current value of goods and services produced in past years.**
3. ***False*. GDP measures the production of the nation. Even during recessions, many people's incomes rise.**
4. ***True*. Real GDP would fall by about two percent because the inflation rate is higher than the rate of growth in nominal GDP.**
5. ***False*. If the index is to be a measure of the prices of goods that are actually consumed or used, each commodity should be weighted according to how large the item is in people's actual pattern of consumption or use. Since different groups have different consumption patterns, it is almost impossible to construct a weighted price index that measures everyone's cost of living.**
6. ***False*. Structural unemployment occurs because people do not have the skills necessary for the jobs that are available. Frictional unemployment occurs when people are between jobs. They will find jobs, but friction in the system means it will take time to match people with the available jobs for which they are qualified.**
7. **Borrowers pay back a fixed number of dollars, but these dollars are worth less. The lender, of course, receives the lower-valued dollars. If the lender has a variable interest rate and inflation causes interest rates to rise, the lender will not be hurt as badly because the lender will charge a higher rate of interest.**
8. ***False*, although this is sometimes the case. Use the data in Activity 14 to illustrate this.**
9. ***False*. Because some people are between jobs and because some people are unqualified for jobs, economists believe the full-employment unemployment rate is five to six percent.**
10. **For the seasonally unemployed person, it can be a worry. However, stimulating the economy might not improve the situation.**

Answers to Sample Multiple-Choice Questions

1. d
2. b
3. c
4. d
5. e
6. a
7. d
8. a
9. c
10. d
11. c
12. c
13. a
14. a
15. b
16. b
17. d
18. b
19. a
20. b

Answers to Sample Short Essay Questions

1. *False.* The value-added approach to GDP avoids double counting. The value added at each stage is reflected in the final goods and services. Therefore, the efforts and incomes of millions of citizens are not ignored.

2. *True.* Market transactions are counted in GDP, but nonmarket transactions are not counted.

3. a. Output is three percent lower than last year and next year's output may be still lower.
   b. Lower output causes more unemployment and a lower standard of living for some people.
   c. Real GDP is adjusted for price changes and is a more accurate measure of economic production.

4. This means that 6.1 percent of those people willing and able to work cannot find jobs. It is the percentage of the labor force unemployed. You would probably want to know the unemployment rate for sub-groups such as blacks, teens, men, and women. Before devising a strategy, you would want to know whether the unemployment was frictional, structural, or cyclical.

5. a. Inflation is an ongoing rise in the price level.
   b. They used a price index, probably the Consumer Price Index.
   c. It was higher than 1.1 percent in each of the 20 years.

6.

Year	Price index
1990	73
1991	83
1992	100
1993	110
1994	117

Answers to Sample Long Essay Questions

1. Unanticipated inflation is a general rise in the price level that is not expected. Lenders will be hurt because they have not considered inflation when setting their interest rates. Because of this, lenders will be paid back in cheaper dollars.

   Borrowers will be helped because they will pay back their loans with cheaper dollars. Homeowners are generally helped by inflation. This is because the price of the house will increase. If the homeowner has a fixed-interest-rate mortgage, the homeowner will pay back fixed dollars to the lender, but these dollars will be worth less.

   The federal government has the largest debt of all and is therefore helped in the same way as other borrowers.

2. a. An increase of three percent in real GDP means that the real output of final goods and services has increased by three percent. This is real growth because real GDP is adjusted to reflect constant purchasing power. Nominal GDP is deflated to reflect price changes when it is converted to real GDP. An increase of three percent in real GDP means the economy has grown three percent since last year.

   An unemployment rate of 6.1 percent means that 6.1 percent of people who are willing and able to work cannot find jobs. This is close to full employment because economists consider five to six percent unemployment to be full employment. This is because some people are voluntarily (frictionally) unemployed and some do not have the skills that are necessary for employment (structurally unemployed).

   The Consumer Price Index shows that a weighted market basket of goods and services rose six percent. Although this is not exactly a cost-of-living index for each individual, it does reflect considerable inflation.

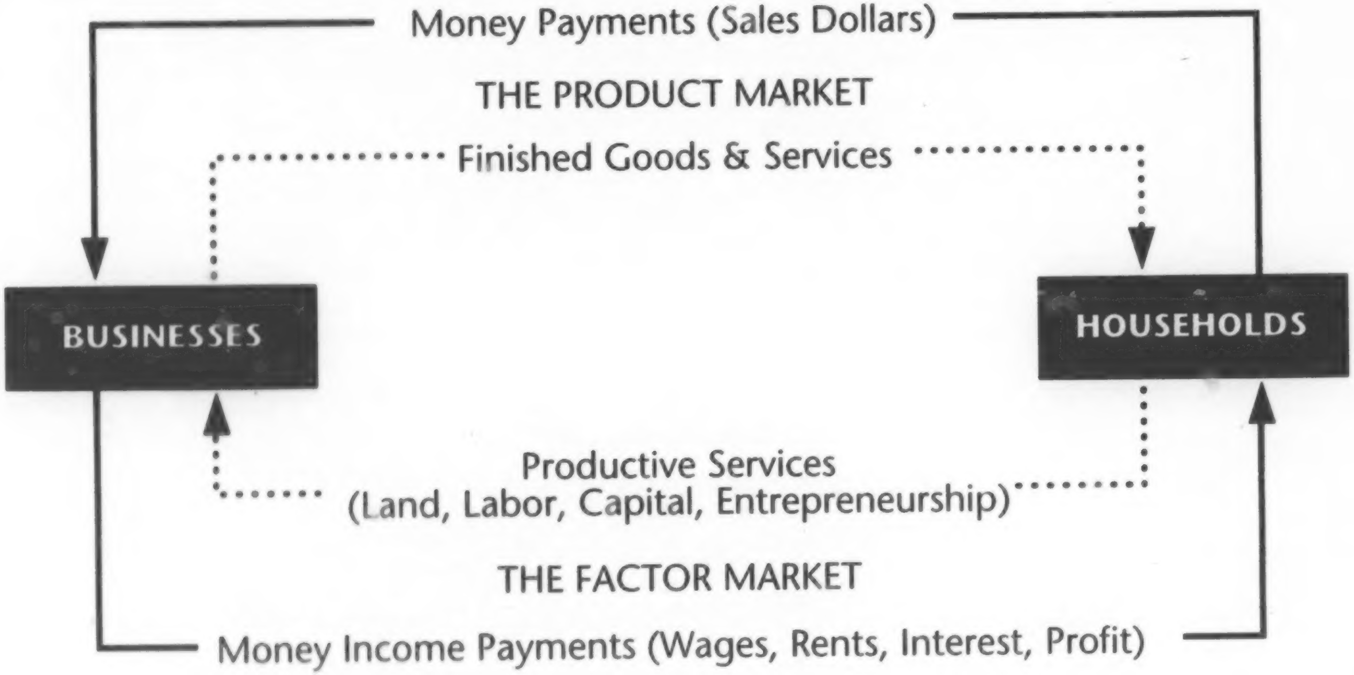
   The fact that the Index of Leading Economic Indicators is up indicates that the economy should continue to expand for six to nine months in the future.

   The rise in the prime rate reflects that people want to borrow and have pushed up this rate. The higher rate may also reflect increases in the price level as vendors try to protect themselves from inflation.

   b. Overall, this is a strong economy which is close to full employment. However, the expansion has generated some demand-pull inflation.

Visual 2.1

The Circular Flow of Resources, Goods, Services, and Money Payments



Money Payments (Sales Dollars)

THE PRODUCT MARKET

Finished Goods & Services

BUSINESSES

HOUSEHOLDS

Productive Services
(Land, Labor, Capital, Entrepreneurship)

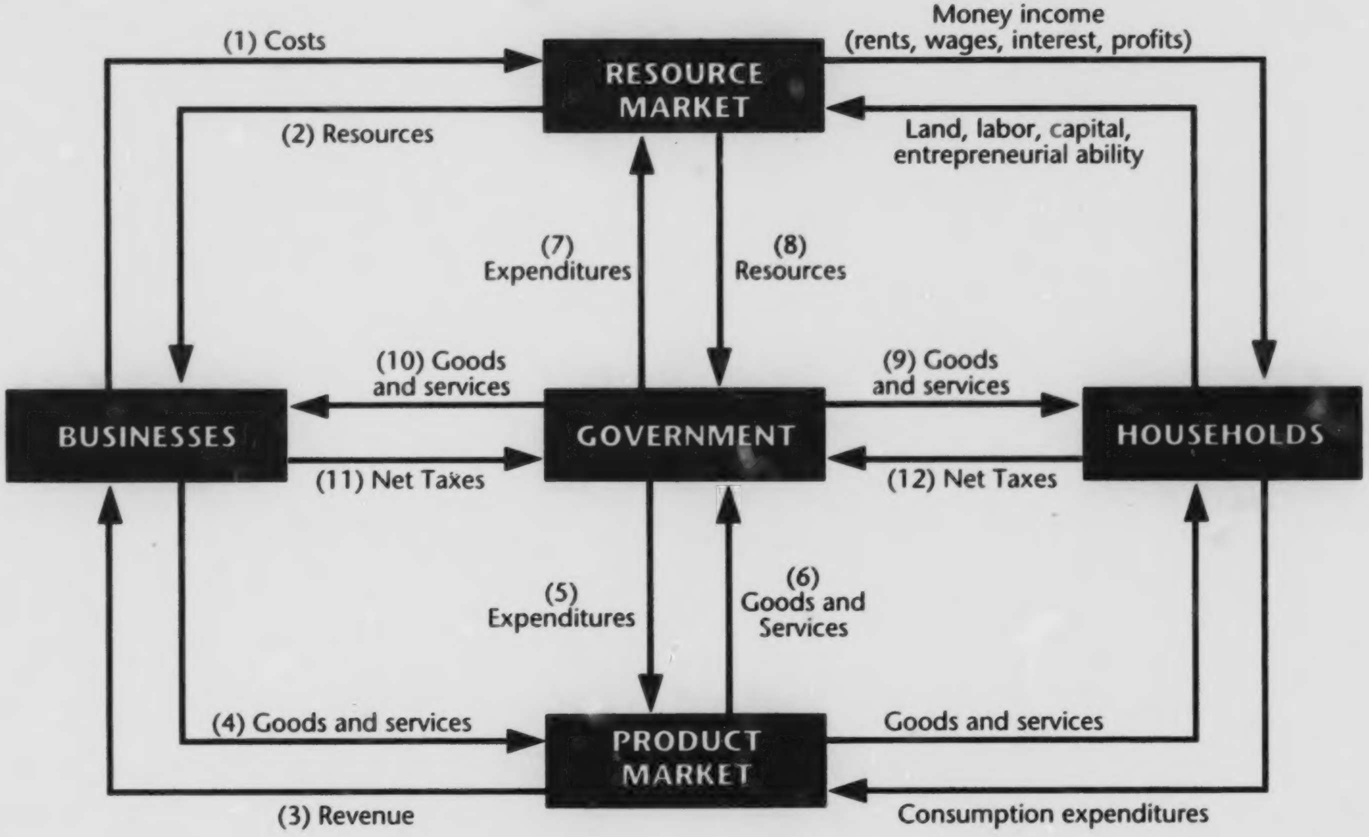
THE FACTOR MARKET

Money Income Payments (Wages, Rents, Interest, Profit)

From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

Visual 2.2

Adding Government to the Circular Flow


(1) Costs
RESOURCE MARKET
Money income
(rents, wages, interest, profits)
(2) Resources
Land, labor, capital, entrepreneurial ability
(7) Expenditures
(8) Resources
(10) Goods and services
(9) Goods and services
BUSINESSES
GOVERNMENT
HOUSEHOLDS
(11) Net Taxes
(12) Net Taxes
(5) Expenditures
(6) Goods and Services
(4) Goods and services
Goods and services
PRODUCT MARKET
(3) Revenue
Consumption expenditures

From Campbell R. McConnell and Stanley L. Brue: *Economics*, 12th edition. Copyright © by McGraw-Hill, Inc., New York, 1993. All rights reserved.

Visual 2.3

Broad Economic and Social Goals

1. Economic freedom
2. Economic efficiency
3. Economic equity
4. Economic security
5. Full employment
6. Price stability
7. Economic growth

Macroeconomics

Unit 3

Aggregate Demand and Aggregate Supply: Fluctuations of Outputs and Prices

20 Days

Unit Overview

This material is the heart of the AP Macroeconomics course. Not only is the content important, but the method of analysis developed in this unit is used heavily in subsequent units.

These lessons are long because they are grouped into the natural component parts of the unit. Lesson 1 develops the basic aggregate demand and supply (AD/AS) model. Lesson 2 compares the Keynesian and classical theories using the analysis covered in Lesson 1. Lesson 3 builds the Keynesian model and reconciles it with the AD/AS model. Lesson 4 describes and analyzes fiscal policy using both the AD/AS and Keynesian models. Finally, Lesson 5 provides practice using the economic tools learned in the unit.

Students must understand the graphs used in this unit. Beginning with the May 1996 AP Exam, students will be required to interpret, use, and draw graphs. It would be difficult if not impossible to pass the AP Macroeconomics Exam without understanding the AD/AS model. The Keynesian model is very useful although most essay questions can probably be answered using the AD/AS model.

Textbook Assignments

Baumol and Blinder, Chapters 24, 25, 26, 27, 28

McConnell and Brue, Chapters 9, 10, 11, 12

Miller, Chapters 9, 10, 11, 12

Planning Ahead

This is the most difficult material your students will encounter in a macroeconomics course. The problem is that the detailed examination of each part of the Keynesian and aggregate supply and demand models will overwhelm the students, and they may not know why they are studying all this material. The AP Test may have specific questions on interpreting graphs of the Keynesian and AD/AS models; on calculating MPC, MPS, and the multiplier; and on identifying Keynesian equilibria. We expect that many questions will involve using the models to analyze economic problems and solutions. Students should be able to analyze the effects of various fiscal policies for addressing economic problems. It would be a good idea to raise current events and issues as you cover the material in this unit.

We have organized this unit using the organization in the McConnell/Brue and Miller textbooks. Baumol/Blinder covers the material differently, and you may have to reorganize Activities to fit their format.

We develop the AD/AS model first and then follow it by using the Keynesian aggregate expenditure model. After reconciling the two models, fiscal policy is analyzed using both the AD/AS and Keynesian formats. Of the two basic models, the AD/AS model is more versatile and is essential to scoring well on the AP Macroeconomics Exam. Each year texts add more to their AD/AS analysis. If you don't have time for all of Lesson 3, be sure to cover the multiplier.

Students must understand and be able to analyze graphs if they are to do well on this unit. Therefore, we have provided 17 Visuals and numerous graphing exercises.

Unit 3 Activities

Activity 16 An Introduction to Aggregate Demand
Activity 17 An Introduction to Short-Run Aggregate Supply
Activity 18 The Equilibrium Price Level and Equilibrium Output
Activity 19 Long-Run Aggregate Supply (LRAS) and the Production Possibilities Curve (PPC)
Activity 20 Manipulating the AD/AS Model: Exogenous Demand and Supply Shocks
Activity 21 Full Employment in a Capitalist Economy (Part 1)
Activity 22 Full Employment in a Capitalist Economy (Part 2)
Activity 23 Classical and Keynesian Views of the Economy
Activity 24 What Is an MPC?
Activity 25 The Consumption Function
Activity 26 Plotting the Investment Function
Activity 27 The Magic of the Multiplier
Activity 28 Keynesian Equilibrium Without Government
Activity 29 Reconciling the Keynesian Aggregate Expenditure Model with the Aggregate Demand and Supply Model
Activity 30 Discretionary and Automatic Fiscal Policy
Activity 31 The Tools of Fiscal Policy
Activity 32 Two Ways to Analyze Fiscal Policy
Activity 33 Analyzing the Macroeconomy

Visuals

Visual 3.1 The Aggregate Demand Curve
Visual 3.2 Shifts in Aggregate Demand
Visual 3.3 The Aggregate Supply Curve
Visual 3.4 Shifts in Aggregate Supply
Visual 3.5 The Equilibrium Price Level and Output
Visual 3.6 The Effects of Shifts in Aggregate Demand
Visual 3.7 The Effects of Shifts in Aggregate Supply
Visual 3.8 Long-Run Aggregate Supply
Visual 3.9 The Consumption Schedule
Visual 3.10 The Investment Schedule
Visual 3.11 Equilibrium GDP
Visual 3.12 A Recessionary Gap
Visual 3.13 An Inflationary Gap
Visual 3.14 Expansionary Fiscal Policy
Visual 3.15 Expansionary Fiscal Policy (Keynesian Model)
Visual 3.16 Contractionary Fiscal Policy
Visual 3.17 Contractionary Fiscal Policy (Keynesian Model)

Sample Unit 3 Plan

Week 1	**Week 2**
1. Use Visual 3.1 to discuss why an AD curve is downsloping. 2. Use Visual 3.2 to discuss the determinations of AD. 3. Assign Activity 16 and: Baumol, Chaps. 24, 25; McConnell, Chap. 9; Miller, Chap. 9.	1. Go over Activity 20. 2. Assign: Baumol, parts of Chap. 25; McConnell, Chap. 10; Miller, Chap. 10.
1. Go over Activity 16. 2. Use Visual 3.3 to discuss the 3 stages of the AS curve. 3. Use Visual 3.4 to discuss the determinants of AS. 4. Assign Activity 17.	1. Use Activities 21 and 22 to compare and contrast the Keynesian and classical theories. 2. Assign Activity 23.
1. Go over Activity 17. 2. Use Visual 3.5 to discuss how AD and AS curves determine equilibrium. 3. Use Visual 3.6 to show how shifts in AD affect output and the price level. 4. Use Visual 3.7 to show how shifts in AS affect output and the price level. 5. Assign Activity 18.	1. Go over Activity 23. 2. Assign: Baumol, Chap. 26; McConnell, Chap. 11; Miller, Chap. 11.
1. Go over Activity 18. 2. Use Visual 3.8 to discuss differences between SRAS and LRAS. 3. Assign Activity 19.	1. Discuss consumption and savings as related to income. 2. Have students complete Activity 24; discuss the answers.
1. Go over Activity 19. 2. Have students complete Activity 20 in small groups.	1. Use visual 3.9 to discuss the consumption and savings functions. 2. Have students complete Activity 25; discuss the answers. 3. Assign Baumol, Chap. 27.

SAMPLE UNIT 3 PLAN continued

Week 3	**Week 4**
1. Use Visual 3.10 to explain the investment function. 2. Discuss factors that determine the level of investment spending. 3. Have students complete Activity 26; discuss the answers.	1. Discuss Activity 31. 2. Graphically illustrate fiscal policy with Visuals 3.14, 3.15, 3.16, and 3.17. 3. Assign Activity 32.
1. Use lecture and discussion to explain the multiplier. 2. Have students complete Activity 27; discuss the answers.	1. Discuss answers to Activity 32. 2. Have students illustrate Activities 30 and 31 with AD/AS and Keynesian curves. 3. Assign Activity 33.
1. Use Visual 3.11 to discuss Keynesian equilibrium. 2. Use Visual 3.12 to discuss a recessionary gap. 3. Use Visual 3.13 to discuss an inflationary gap. 4. Assign Activity 28.	Discuss Activity 33.
1. Go over Activity 28. 2. Give a lecture reconciling the AD/AS model and Keynesian model. 3. Have students complete Activity 29; discuss the answers. 4. Assign: Baumol, Chap. 28; McConnell, Chap. 12; Miller, Chap. 12.	Review for test using Sample Multiple-Choice and Essay Questions.
1. Provide an overview of fiscal policy. 2. Have students complete Activity 30; discuss the answers. 3. Assign Activity 31.	Unit Test.

UNIT 3, LESSON 1

Aggregate Supply and Aggregate Demand: Fluctuations in Outputs and Prices

Introduction and Description

In the past ten to fifteen years, the biggest pedagogical innovation in teaching the college introductory economics course has been the use of aggregate supply and demand curves to illustrate important macroeconomic concepts and policy issues. Because these curves look and operate much like microeconomic supply and demand curves, students are familiar with them. Unfortunately, the conceptual underpinnings of aggregate supply and demand curves are quite different from the conceptual underpinnings of microeconomic supply and demand curves for an individual product or productive resource. Consequently, an important goal of this unit is to make sure that students understand these differences.

Because aggregate supply and demand curves are so new, college textbooks differ in how they build this analysis. For example, some texts have a three-stage short-run aggregate supply curve while others have an upsloping short-run aggregate supply curve. Some textbooks emphasize long-run aggregate supply more than others. Any conceptually consistent analysis will prepare the students for the AP Test.

This lesson covers aggregate supply and demand curves in a way similar to the way microeconomic supply and demand curves were covered. The method of organization is as follows:

A. Aggregate demand and shifting
B. Aggregate supply and shifting
C. Short-run equilibrium
D. Long-run aggregate supply
E. Applying aggregate demand and supply to macroeconomic concepts and policy issues

This lesson is very important. Beginning in May 1996, students will be required to interpret, use, and draw aggregate supply and demand graphs.

Objectives

1. Define *aggregate demand, aggregate supply,* and *equilibrium.*
2. Explain why an aggregate demand curve is downsloping.
3. Describe the reasons for the horizontal, vertical, and upward-sloping segments of the aggregate supply curve.
4. List, explain, and analyze the basic causes of shifts in aggregate demand and aggregate supply and the effects of these shifts on real national output and the price level.
5. Distinguish between short-run aggregate supply (SRAS) and long-run aggregate supply (LRAS).
6. Use aggregate supply and demand curves to analyze the effects of macroeconomic events on real national output and the price level.
7. Analyze macroeconomic policy issues using aggregate supply and demand curves.

Time Required

- Six class periods

Materials

1. Activities 16, 17, 18, 19, and 20
2. Visuals 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8

Procedure

1. Project Visual 3.1 and define an *aggregate demand curve.* Be sure to cover the reasons the AD curve is downsloping and how it differs from a demand curve for a microeconomic good or resource. The rationale for a downsloping AD curve includes these three factors: the wealth effect, the income effect, and the foreign purchases effect.
2. Project Visual 3.2 and explain the determinants of aggregate demand. These are factors that cause the AD curve to shift and include changes in (1) consumer spending,

Michael Watts, Purdue University, W. Lafayette, IN, contributed ideas to this lesson.

LESSON 1 continued

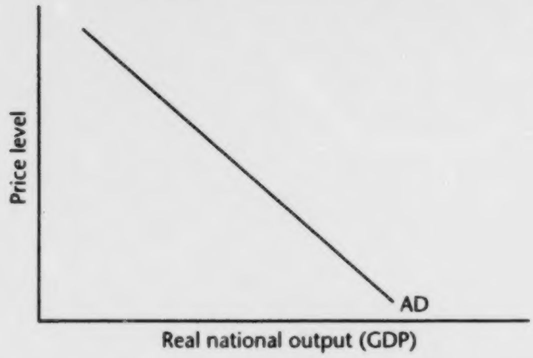
(2) investment spending, (3) government spending, and (4) net export spending.

3. Have the students complete Activity 16 and go over the answers.
4. Project Visual 3.3 and explain the three stages of the aggregate supply curve. Be sure to cover the reasons that each stage is shaped as it is:
   a. The horizontal or Keynesian range indicates the economy is in a recession or depression.
   b. The vertical or classical range implies that the economy is at full employment.
   c. The intermediate range is between these two extremes. In this range, there is a tradeoff between inflation and unemployment. Higher GDP is accompanied by a rising price level.
5. Project Visual 3.4 and explain the determinants of aggregate supply. These are the factors that cause the AS curve to shift and include changes in (1) the prices of inputs (land, labor, capital, and entrepreneurship); (2) productivity; (3) technology; and (4) government taxes, subsidies, and regulations.
6. Have the students complete Activity 17 and go over the answers.
7. Project Visual 3.5 and discuss how the AD and AS curves determine the equilibrium level of GDP and the price level.
8. Project Visual 3.6 and explain how shifts in aggregate demand affect the equilibrium level of GDP and the price level.
9. Project Visual 3.7 and explain how shifts in aggregate supply affect the equilibrium level of GDP and the price level.
10. Have the students complete Activity 18 and discuss the answers.
11. Project Visual 3.8 and explain the difference between long-run aggregate supply and short-run aggregate supply. The long-run AS (LRAS) curve is a vertical line indicating the amount of goods and services a nation can produce using all of its productive resources as efficiently as possible. The LRAS curve also assumes that the nation is using all of the productive technologies available to it. In this way, the LRAS curve is similar to a production possibilities curve. The LRAS curve moves outward when there is economic growth, but it is still a vertical line.
12. Have the students complete Activity 19 and go over the answers.
13. Finally, have the students complete Activity 20 and go over the answers. The activity applies AD/AS analysis to economic events and macroeconomic policy issues.

ACTIVITY 16 **ANSWER KEY**
An Introduction to Aggregate Demand

Part A. Why Is the Aggregate Demand Curve Downsloping?

Aggregate Demand Curve



1. According to the AD curve, what is the relationship between the price level and real national output?
The lower the price level, the higher the real national output.

2. In what ways do the reasons that explain the downward slope of the AD curve differ from the reasons that explain the downward slope of the demand curve for a single product?
The macroeconomic AD curve shows the relationship between the average price level for *all* goods and services and the quantity of *all* goods and services people are willing to buy. There is no substitution effect for the AD curve, but there is a substitution effect for the demand curve for a single good, service, or resource.

3. Explain how each of the following effects helps explain why the AD curve is downward sloping.

   a. Interest rate effect
   Lower prices decrease the demand for money, which lowers interest rates and increases investment and therefore the quantity of AD.

   b. Real balances effect
   As the price level falls, cash balances will buy more so people spend more thus increasing the quantity of AD.

   c. Foreign purchases effect
   Lower prices mean prices for goods produced in the United States are a better buy than foreign-made goods. This increases net exports, a component of AD.

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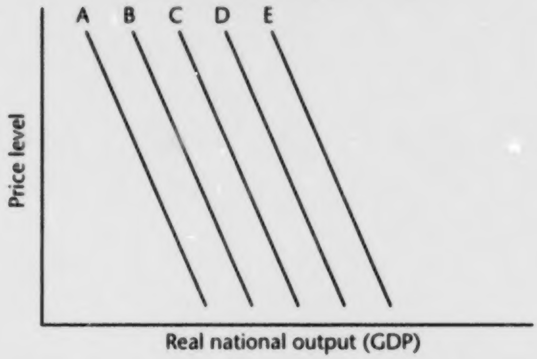
ACTIVITY 16 ANSWER KEY continued

Part B. Shifts in Aggregate Demand

Shifts in Aggregate Demand



For each situation described below, determine if the event will increase or decrease AD. Start with AD curve *C*. If you think the first situation would increase AD, write "increase" and move to curve *D*. If you think the first situation would decrease AD, write "decrease" and move to curve *B*. Move only one curve at a time. Do not skip a curve even if you think the situation would cause a huge increase or decrease in AD. If you think an event would not cause AD to shift, write "no change." Do not go beyond the five curves. If you need to go beyond the five curves, you need to rethink your answers!

1. Congress cuts taxes.

   AD **increase** Curve **D**

2. Survey shows business investment spending decreased last month.

   AD **decrease** Curve **C**

3. Government spending to increase next fiscal year; President promises no increase in taxes.

   AD **increase** Curve **D**

4. Survey shows consumers are confident about future economy.

   AD **increase** Curve **E**

5. Business leaders feel economy is headed for recession.

   AD **decrease** Curve **D**

6. Stock market collapses—investors lose billions.

   AD **decrease** Curve **C**

7. Productivity rises for fourth straight year.

   AD **no change** Curve **C**

8. President cuts defense spending by 20 percent; no increase in domestic spending.

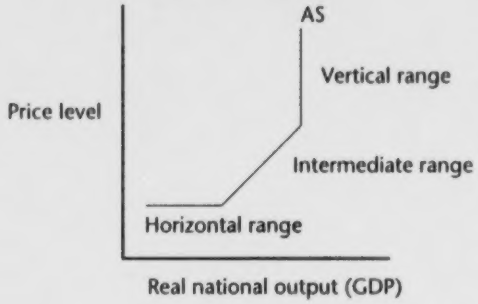
   AD **decrease** Curve **B**

ACTIVITY 17 **ANSWER KEY**

An Introduction to Short-Run Aggregate Supply

Part A. Why Does the Aggregate Supply Curve Look So Funny?

Aggregate Supply Curve



1. Under what conditions would AS be in the horizontal range?
   When there are a lot of unemployed resources—a recession or depression.

2. Under what conditions would AS be in the vertical range?
   AS is vertical when real GDP is at a level with unemployment below the full-employment level where any increase in demand will result only in an increase in prices.

3. Under what conditions would AS be in the intermediate range?
   In this range, resources are getting closer to full-employment levels, which creates upward pressure on wages and prices.

4. What difference does it make if AS is in the horizontal, intermediate, or vertical range?
   Increasing or decreasing AD will have a different effect on real national output and the price level depending on how fully resources are employed.

5. Economists believe that AS in the vertical range represents potential GDP at full employment. Why?
   Because there are no more resources to employ, output cannot increase.

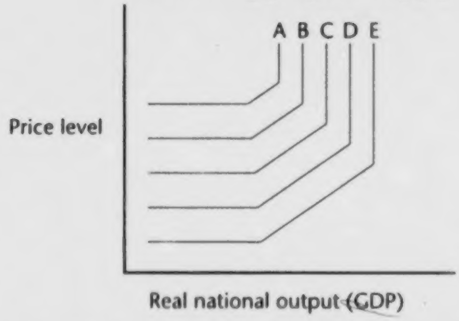
6. a. What range do you think AS is in today?

   b. Why?
   Answers depend on current economic conditions.

ACTIVITY 17 ANSWER KEY continued

Part B. Shifts in Aggregate Supply

Shifts in Aggregate Supply



This Activity is similar to Part B of Activity 16, but it shows shifts in aggregate supply. For each situation described, determine if the event will increase or decrease AS. Start with AS curve *C*. If you think the first situation would increase AS, write "increase" and move to curve *D*. If you think the first situation would decrease AS, write "decrease" and move to curve *B*. Move only one curve at a time. Do not skip a curve even if you think a situation will cause a huge increase or decrease in AS. If you think a situation will not cause AS to shift, write "no change." Do not go beyond the five curves. If you go beyond the five curves, you should rethink your answer!

1. Unions grow more aggressive; wage rates increase.

   AS **decrease** Curve **B**

2. OPEC successfully increases oil prices.

   AS **decrease** Curve **A**

3. Labor productivity increases dramatically.

   AS **increase** Curve **B**

4. Giant natural gas discovery decreases energy prices.

   AS **increase** Curve **C**

5. Computer technology brings new efficiency to industry.

   AS **increase** Curve **D**

6. Government spending increases.

   AS **no change** Curve **D**

7. Cuts in tax rates increase incentives to save.

   AS **increase** Curve **E**

8. Low birth rate to decrease labor force in future.

   AS **decrease** Curve **D**

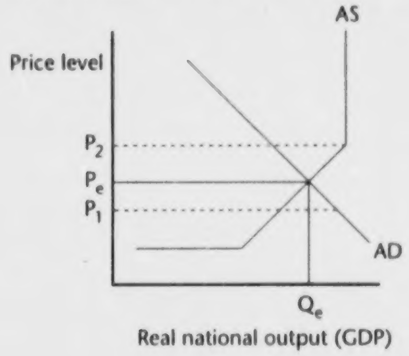
9. Research shows that improved schools have increased the skills of American workers and managers.

   AS **increase** Curve **E**

ACTIVITY 18 **ANSWER KEY**
The Equilibrium Price Level and Equilibrium Output

Part A. Equilibrium

Equilibrium Price Levels and Output



1. What are the equilibrium price level and output? ***P_e* and *Q_e***

2. a. What would eventually happen to the price level and output if the initial price level were *P_2* rather than *P_e*?
   Inventories would increase. To reduce those inventory levels, firms would cut prices and output. The price level would fall, and real national output would decrease.

   b. Why would this happen?
   Higher inventories would cause sellers to reduce prices; lower prices would provide fewer incentives for increased production. However, consumers will purchase more output at lower prices.

3. a. What would eventually happen to the price level and output if the initial price level were *P_1* rather than *P_e*?
   Inventories would fall below intended levels. Firms would seek to increase inventory levels, and prices would rise, and output would decrease.

   b. Why would this happen?
   Competition among buyers would increase the price level; increased prices would encourage producers to increase their output.

ACTIVITY 18 ANSWER KEY continued

Part B. Changes in the Equilibrium Price Level and Output

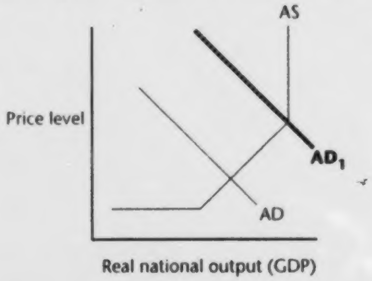
For each situation described, illustrate the change on the AD/AS graph and describe the effect on the equilibrium price level and real national output by circling the correct arrow (↑ for increase, ↓ for decrease, — for unchanged).

1. Congress passes a tax cut for the middle class, and the President signs it.

   Price level [✓ ↑] ↓ —

   Real national output (GDP) [✓ ↑] ↓ —

Change A—Middle Class Tax Cut

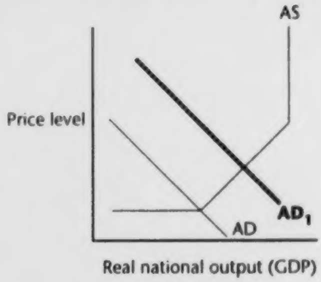


2. During a recession, the government increases spending on schools, highways, and other public works.

   Price level [✓ ↑] ↓ —

   Real national output (GDP) [✓ ↑] ↓ —

Change B—Increased Government Spending

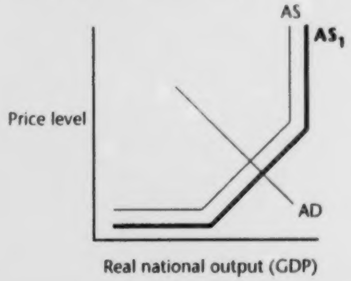


3. New oil discoveries cause large decreases in energy prices.

   Price level ↑ [✓ ↓] —

   Real national output (GDP) [✓ ↑] ↓ —

Change C—New Oil Discoveries

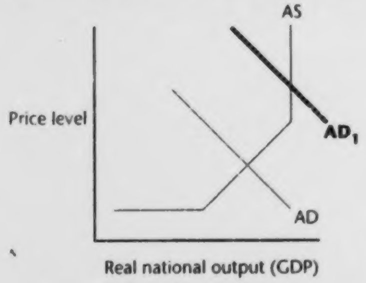


4. Illustrate the effects of demand-pull inflation.

   Price level [✓ ↑] ↓ —

   Real national output (GDP) [✓ ↑] ↓ —

Change D—Effects of Demand-Pull Inflation



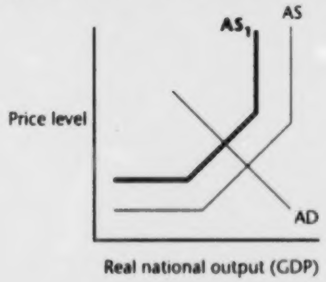
ACTIVITY 18 ANSWER KEY continued

5. Illustrate the effects of cost-push inflation.

   Price level [✓ ↑] ↓ —

   Real national output (GDP) ↑ [✓ ↓] —

Change E—Effects of Cost-Push Inflation

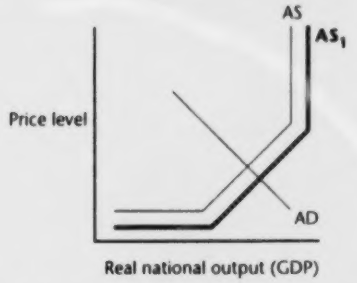


6. New technology and better education increase productivity.

   Price level ↑ [✓ ↓] —

   Real national output (GDP) [✓ ↑] ↓ —

Change F—Effects of New Technology and Better Education

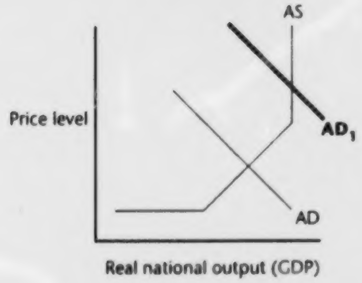


7. A new President makes consumers and businesses more confident about the future economy. *Note: Show the change in AD only.*

   Price level [✓ ↑] ↓ —

   Real national output (GDP) [✓ ↑] ↓ —

Change G—Increased Confidence for Future Economy

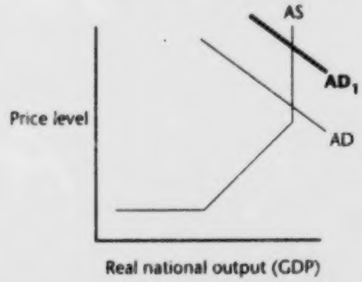


8. With the unemployment rate at five percent, the federal government reduces personal taxes and increases government spending. *Note: Show the change in AD only.*

   Price level [✓ ↑] ↓ —

   Real national output (GDP) ↑ ↓ [✓ —]

Change H—Reduced Taxes and Increased Government Spending

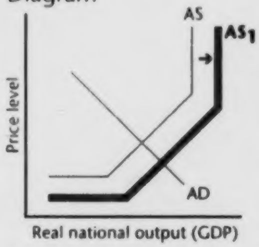
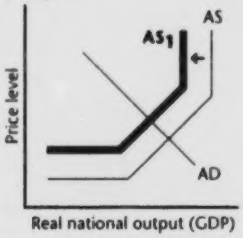
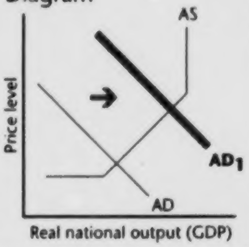
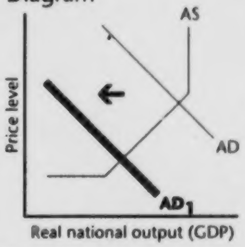


ACTIVITY 18 ANSWER KEY continued

Part C. Summarizing Aggregate Demand and Aggregate Supply Shifts

For each of the events, make additions to the diagram that illustrate the change. Then indicate the response in terms of shifts in or movements along the aggregate demand or aggregate supply curve and the effect on real national output and the price level in the short run. Indicate *shifts* in the curve by **S** and movements *along* the curve by **A**. Indicate the changes in price level, unemployment, and real national output with + for an increase and – for a decrease.

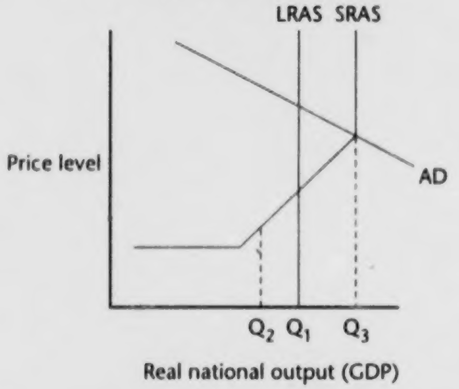
Events:

1. Increase in labor productivity due to technological change	2. Increase in the price of inputs used by many firms	3. Boom in investment assuming some unemployed resources are available	4. A major reduction in investment spending
Diagram  AS AS₁ → Price level AD Real national output (GDP)	Diagram  AS AS₁ ← Price level AD Real national output (GDP)	Diagram  AS → Price level AD₁ AD Real national output (GDP)	Diagram  AS ← Price level AD AD₁ Real national output (GDP)
AD Curve **A**	**A**	**S**	**S**
AS Curve **S**	**S**	**A**	**A**
Real National Output +	–	+	–
Price Level –	+	+	–
Unemployment –	+	–	+

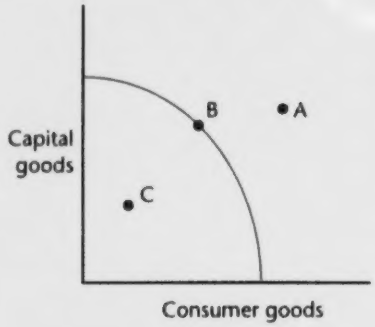
ACTIVITY 19 **ANSWER KEY**

Long-Run Aggregate Supply (LRAS) and the Production Possibilities Curve (PPC)

LRAS and SRAS Curves



PPC Graph



1. What information does a PPC provide for us about a nation's economy?
The possible combinations of output for two types of goods for an economy as a whole when it is fully employing its resources.

2. What assumptions about the use of available resources are inherent in a PPC?
Resources are fully employed and are being used in the most efficient way given the current state of technology.

3. What forces or conditions will cause a nation's PPC to move?
Changes in the amount of resources or changes in technology.

4. What does the LRAS tell us about a nation's economy?
It shows the potential level of output when resources are fully employed in the most efficient way given the current state of technology.

5. Why is the LRAS curve vertical?
Because all resources are fully employed, output cannot be increased.

6. If the price level rises, will LRAS shift? Will it shift if AD changes? **No; no**

7. If an economy finds that it faces a short-run equilibrium where real national output is Q_2, how would you describe the condition of the economy? Given this equilibrium level of output, at what point would we lie on the PPC graph? Explain your answer.
Resources are unemployed. The economy is inside the PPC at point C. The economy can produce more consumer goods and more capital goods if all of its scarce resources are employed fully.

ACTIVITY 19 ANSWER KEY continued

8. If an economy finds that it faces a short-run equilibrium where real national output is Q_1, how would you describe the condition of the economy? Given this equilibrium level of output, at what point would we lie on the PPC graph? Explain your answer.
At point *B* on the PPC, all resources are fully employed.

9. If an economy finds that it faces a short-run equilibrium where real national output is Q_3, how would you describe the condition of the economy? Given this equilibrium level of output, at what point would we lie on the PPC graph? Explain your answer.
Overheated and at point *A*. The economy is working beyond the full-employment level, but this combination cannot be sustained unless LRAS increases.

10. If the economy were producing at Q_3, what would happen in the long run? Why?
Output would decrease. People can work overtime and plants can increase production more without maintenance problems only in the short run. Price levels will rise. Wage levels will begin to increase.

11. What could cause LRAS to shift?
Developing more productive resources or improving technology.

12. If the LRAS curve shifted to the right, what would happen on the PPC graph?
It would also shift to the right or more outward.

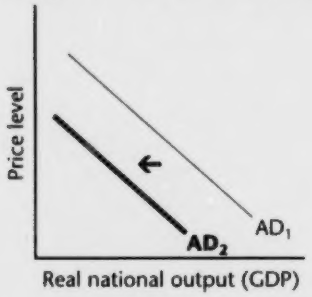
ACTIVITY 20 **ANSWER KEY**

Manipulating the AD/AS Model: Exogenous Demand and Supply Shocks

Part A. Exogenous Demand Shocks

Read the description of each exogenous shock to aggregate demand and then draw a new AD curve that will represent the change caused by the demand shock. Label the new curve AD_2. Then briefly explain the reason for the change in the graph.

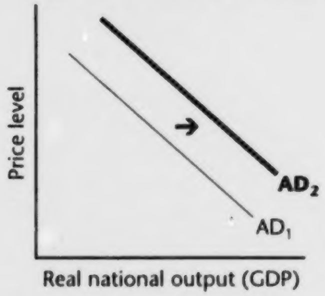
1. **Exogenous Demand Shock A**



EXOGENOUS SHOCK A:
General Motors lays off 30,000 workers.

EXPLANATION:
Workers' benefits will be far less than their regular pay; their expenditures and the expenditures of many others who will be laid off as a result of their lost business will cause AD to diminish.

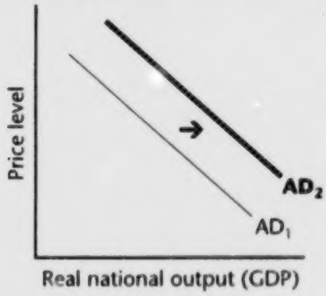
2. **Exogenous Demand Shock B**



EXOGENOUS SHOCK B:
Economic booms in both Japan and Europe result in massive increases in orders for exported goods from the United States.

EXPLANATION:
Increased orders for exports will cause more people to be hired, and their increased income will result in increased consumer spending. AD will increase.

3. **Exogenous Demand Shock C**



EXOGENOUS SHOCK C:
As part of its countercyclical policy, the government both reduces taxes and increases transfer payments.

EXPLANATION:
With increased discretionary incomes, tax-payers will increase consumption. AD will increase.

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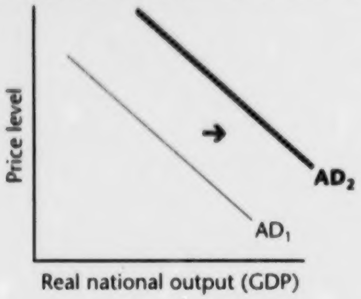
ACTIVITY 20 ANSWER KEY continued

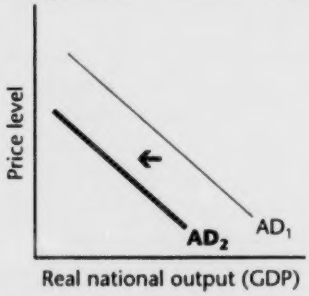
4. **Exogenous Demand Shock D**



EXOGENOUS SHOCK D:
While the United States was in the midst of the Great Depression, a foreign power attacked. Congress declared war and more than 1,000,000 soldiers were drafted in the first year while defense spending was increased several times over.

EXPLANATION:
Now millions of consumers who had been unemployed or reluctant to spend their saved money will respond by purchasing many goods whose purchase had been postponed. The government, too, is increasing spending and demanding goods. AD will increase at a record rate.

5. **Exogenous Demand Shock E**

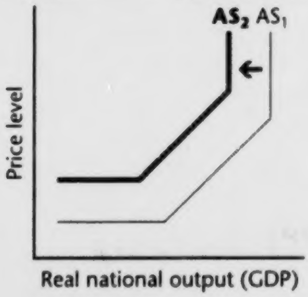


EXOGENOUS SHOCK E:
In order to balance the budget, the federal government cuts Social Security by 10 percent and federal aid to education by 20 percent.

EXPLANATION:
Recipients of Social Security will have less income to spend. Local school districts either will cut back by laying off teachers or will raise taxes. Either will mean less discretionary income. AD will decrease.

Part B. Exogenous Supply Shocks
Read the description of each exogenous shock to aggregate supply and then draw a new AS curve that will represent the change caused by the shock. Label the new curve AS_2. Then briefly explain the reason for the change in the graph.

1. **Exogenous Supply Shock F**

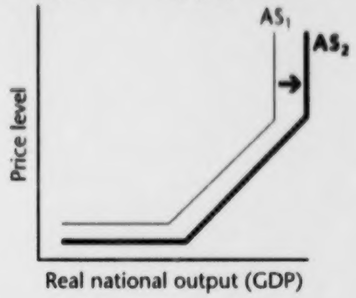


EXOGENOUS SHOCK F:
New environmental standards raise the average cost of autos and trucks five percent.

EXPLANATION:
The new standards are raising the price of producing autos for both consumers and commercial truckers.

ACTIVITY 20 ANSWER KEY continued

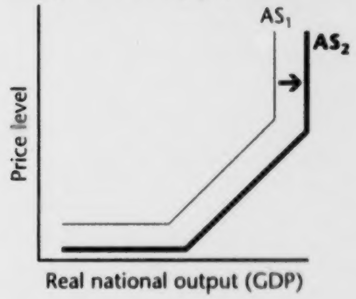
2. **Exogenous Supply Shock G**



EXOGENOUS SHOCK G:
Fine weather results in the highest corn and wheat yields in 40 years.

EXPLANATION:
The fine weather will increase the supply of grains and, assuming that demand remains constant, the price will drop. This will, in turn, lower the price of inputs for most food-related industries.

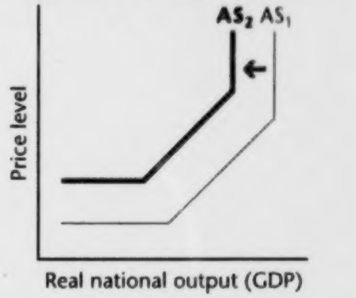
3. **Exogenous Supply Shock H**



EXOGENOUS SHOCK H:
Due to decreased international tensions, the government sells off thousands of Army surplus Jeeps and trucks at prices that are far less than the market price for their commercial counterparts.

EXPLANATION:
Reduced transportation costs mean lower operating costs for most industries.

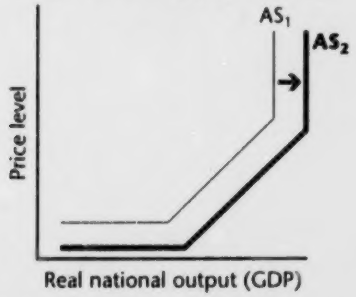
4. **Exogenous Supply Shock I**



EXOGENOUS SHOCK I:
An enemy power mines the sea lanes leading to the United States, and most ships refuse to deliver cargo through the mined areas.

EXPLANATION:
A vastly diminished supply of overseas goods, including parts needed by American industries, will bid up the cost of inputs.

5. **Exogenous Supply Shock J**



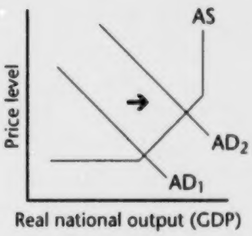
EXOGENOUS SHOCK J:
After a long war, many ships, planes, trucks, and trains that had been commandeered for military use are returned to their civilian operators.

EXPLANATION:
After years of shortages in transportation facilities, there will now be a surplus, which will reduce transportation expenses for businesses.

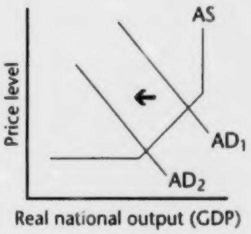
ACTIVITY 20 ANSWER KEY continued

Part C. Manipulating the Aggregate Supply and Demand Model
Read each of the scenarios below and explain the impact the exogenous shocks will have on aggregate supply and demand. Then draw an aggregate demand and aggregate supply diagram to illustrate each impact.

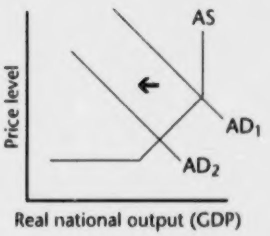
1. During a long, slow recovery from a recession, consumers postponed major purchases. Suddenly they begin to buy cars, refrigerators, televisions, and heating units to replace their failing models.
AD will increase as a result of increased autonomous consumer spending.



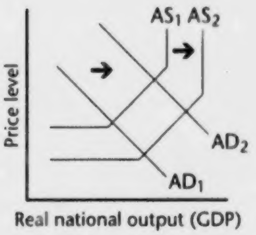
2. With no other dramatic changes, the government raises taxes and reduces transfer payments in the hope of balancing the budget.
Higher taxes reduce disposable income, which reduces consumption. Decreased transfer payments also decrease disposable income and therefore consumption.



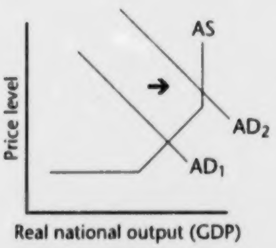
3. News of possible future layoffs frightens the public into reducing spending and saving for the feared "rainy day."
Lower consumer confidence decreases consumption.



4. Due to rising tensions in many developing countries, firms begin to build new factories in the United States and to purchase sophisticated machinery that will enable them to produce here at prices that are competitive with those of low-salaried foreign countries.
More investment spending increases AD. The increase in plant and equipment (capital) increases AS.



5. Brazil solves its foreign debt and inflation problems. It then orders $10 billion worth of capital machinery from the United States.
Higher exports increase AD.



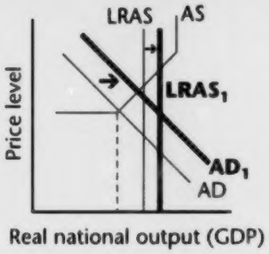
ACTIVITY 20 ANSWER KEY continued

Part D. Responses to All Shocks (Short-Run and Long-Run)
Read the description of each exogenous shock to aggregate supply and aggregate demand and draw a new AS or AD curve that represents the change caused by the shock. In some cases, several curves may be shifted. Then explain the reasons for the change in the graph and the effects of the change on the economy.

1. EXOGENOUS SHOCK K:
   Several Japanese firms open large plants in the United States.

   EXPLANATION:
   Increased investment increases AD, and the increased capital equipment increases LRAS. Aggregate supply may also increase here.

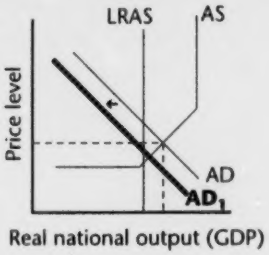
Response to Exogenous Shock K



2. EXOGENOUS SHOCK L:
   In order to lower inflation, the government raises personal income taxes by 20 percent.

   EXPLANATION:
   Higher taxes decrease consumption which decreases AD.

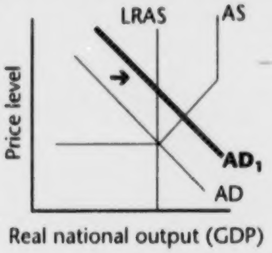
Response to Exogenous Shock L



3. EXOGENOUS SHOCK M:
   The government increases defense spending by 10 percent per year over a five-year period.

   EXPLANATION:
   Higher government spending increases AD.

Response to Exogenous Shock M

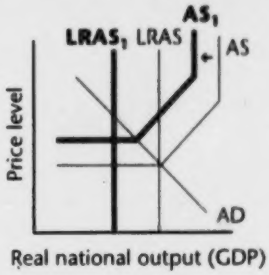


ACTIVITY 20 ANSWER KEY continued

4. EXOGENOUS SHOCK N:
OPEC cuts production by 30 percent, and the world price of oil rises by 40 percent.

EXPLANATION:
Higher production costs decrease AS. If the increase is permanent, LRAS should also decrease.

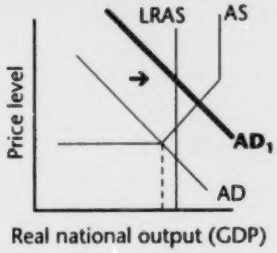
Response to Exogenous Shock N


AS₁
LRAS₁
LRAS
AS
Price level
AD
Real national output (GDP)

5. EXOGENOUS SHOCK O:
The government announces a "War on Poverty" and increases spending on education, health care, housing, and basic services for the poor. No increase in taxes accompanies the program.

EXPLANATION:
Increases in government expenditures increase AD.

Response to Exogenous Shock O


LRAS
AS
Price level
AD₁
AD
Real national output (GDP)

UNIT 3, LESSON 2

Keynesian and Classical Views of the Capitalist Economy

Introduction and Description

This lesson helps students distinguish between the classical and Keynesian views of the economy. Classical theory views full employment as the norm of a capitalist economy and indicates that *laissez-faire* is the best policy to achieve price stability, full employment, and economic growth. The Keynesian view holds that an economy may be at short-run equilibrium below or above full employment. Active government fiscal and monetary policies are used to reach the adjustment to price stability, full employment, and economic growth.

This lesson uses an inductive approach to help students analyze the reasons that Keynesian and classical economists differ in their approaches to the economy in order to sustain full-employment levels of output.

Objectives

1. Describe ideas about what determines the amount of goods and services produced and the level of employment according to the classical theory.
2. Describe ideas about what determines the amount of goods and services produced and the level of employment according to the Keynesian theory.
3. Through inductive analysis, conclude that economists in the past and present hold differing viewpoints on the ability of a capitalist economy to achieve and sustain full-employment levels of output.
4. Distinguish between classical and Keynesian theories of employment and the proper role of government in the economy.

Time Required

- Two class periods

Materials

Activities 21, 22, and 23

Procedure

1. To introduce the lesson, *avoid any mention of differing viewpoints, allowing students to inductively approach the lesson's objectives.* You could introduce the topic by asking, "If society values full employment as an economic goal, is a capitalist economy inherently capable of achieving that goal without intervention on the part of government?"
2. Tell the students that they will address this issue by reading and discussing an article on the subject. Some students will read Activity 21, and some will read Activity 22. *It is critical that students read only the Activity that they are assigned.* You might have students tear out the Activity they are not to read and hand it to you. Divide the students into small groups. Unknown to them, half of the class will be reading the Keynesian viewpoint, and half will be reading the classical viewpoint. All members of each group must read the same activity.
3. Have the students discuss the questions at the end of the reading in their small groups.
4. Upon completion of the small-group assignment, initiate a class discussion of the issue by asking one group to answer the first question. Following the initial group's response, ask the other groups if they agree or disagree, allowing them time to explain their responses and to refute or support the initial group's answer. Select students to summarize the responses on the board as each question is addressed in the same manner. Continuing with this pattern of questioning, students will at some point realize that there are at least two clearly distinct points of view on the answer to each question. At this point, the first objective of the lesson has been accomplished. Continue the discussion/debate until all questions have been addressed thoroughly. At the conclusion of the discussion, inform

Donna Kattner, Conroe High School, Conroe, TX, and James Ranney, Austin E. Lathrop High School, Fairbanks, AK, contributed to this lesson.

LESSON 2 continued

students that the two viewpoints they have derived from the readings are the classical and Keynesian theories of employment and output, and correctly identify each viewpoint for the students.

5. Have the students reinforce these ideas by completing Activity 23.
6. Summarize the Keynesian and classical points of view by using questioning strategies to check for student understanding of key points of difference. Also discuss the questions in Activity 23.
7. Stress the value or importance of the lesson objectives by explaining to the students (or use questioning strategies to allow students to draw their own conclusions) that classical theory dominated U.S. economic thought and policy making up to the Great Depression and that Keynesian thought has dominated since the Great Depression. Students should note how the change in economic thought influenced the extent of government involvement in the U.S. economy. Explain that the debate continues today as many theories (some containing elements of classical theory) have developed over the decades to challenge Keynesian theory and policy making. This lesson can thus be used as a prelude to the study of Keynesian theory and its critics.

ACTIVITY 21 **ANSWER KEY (Keynesian)**
Full Employment in a Capitalist Economy

1. Do business-cycle fluctuations occur as a result of external or internal factors? Explain. **Both external and internal. Level of output depends on level of AE, which is affected by internal and external factors.**

2. Are periods of economic instability temporary, or can they be of long duration? **They vary and can be of long duration. Unemployment can be sustained for an indefinite period of time.**

3. Identify and explain the main determinant of the level of output and employment in the economy.
The level of AD or AE. If income increases, consumers will buy more, and producers will produce more. If income declines, however, consumers will fail to purchase the output produced, and producers will cut back.

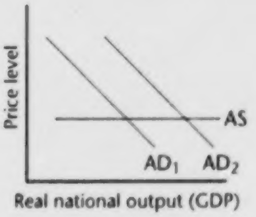
4. If people save their income instead of spending it, what will be the effect on the level of output and employment? Will interest rates automatically equate the leakage of saving with an injection of investment spending by business firms? Explain why or why not.
Some output will not be purchased, and producers will cut back. Interest rates will not automatically adjust. Because savers and investors are different people.

5. Are wages and prices downwardly flexible in the event of decreases in aggregate demand? Explain why or why not.
Wages and prices are not downwardly flexible. Because of collective bargaining agreements between unions and management, which have some monopoly power.

6. Does a capitalist economy contain inherent self-adjusting mechanisms that assist it in achieving and sustaining full-employment levels of output?
No because interest rates, wages, and prices are inflexible.

7. What should be the proper role of government in the capitalist economy? Explain why.
Because the capitalist economy cannot adjust itself automatically, government must have demand-management policies to maintain a full-employment level of output.

8. Describe the shape of the aggregate supply curve. Illustrate how the shape of the AS curve explains, in the event of changing aggregate demand, the conclusion drawn in question 6.
Horizontal. The AS curve is horizontal which means changes in AD affect output but do not affect the price level.



ACTIVITY 22 **ANSWER KEY (Classical)**
Full Employment in a Capitalist Economy

1. Do business cycle fluctuations occur as a result of external or internal factors? Explain.
   External. Caused by temporary abnormalities such as wars and natural disasters. The capitalist economy will automatically readjust after one of these events.

2. Are periods of economic instability temporary, or can they be of long duration?
   They are temporary. In the long run, the economy will self-adjust.

3. Identify and explain the main determinant of the level of output and employment in the economy.
   "Supply creates its own demand." If AD declines, the economy must only produce output to maintain employment; the act of producing output generates the exact amount of income necessary to purchase the output.

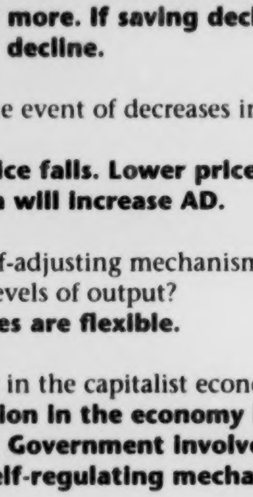
4. If people save their income instead of spending it, what will be the effect on the level of output and employment? Will interest rates automatically equate the leakage of saving with an injection of investment spending by business firms? Explain why or why not.
   Output will not decline. Yes. The mechanism of interest rates maintains an equilibrium between savings and investment. If consumers save more, interest rates will fall and businesses will invest more. If saving declines, interest rates will rise and business investment will decline.

5. Are wages and prices downwardly flexible in the event of decreases in aggregate demand? Explain why or why not.
   Yes. If AD falls, wages fall. If wages fall, price falls. Lower prices will be an incentive for consumers to buy more which will increase AD.

6. Does a capitalist economy contain inherent self-adjusting mechanisms that assist it in achieving and sustaining full-employment levels of output?
   Yes because interest rates, wages, and prices are flexible.

7. What should be the proper role of government in the capitalist economy? Explain why.
   There is no need for government intervention in the economy because of the economy's self-regulating mechanisms. Government involvement in the economy may, in fact, interfere with the self-regulating mechanisms and thereby cause instability.

8. Describe the shape of the aggregate supply curve. Illustrate how the shape of the AS curve explains, in the event of changing aggregate demand, the conclusion drawn in question 6.
   Vertical.
   The AS curve is vertical which means changes in AD affect the price level and not output. The economy automatically adjusts to full employment.



ACTIVITY 23 **ANSWER KEY**
Classical and Keynesian Views of the Economy

Part A. The Classical View

1. **According to the classical theory, equilibrium is always at full employment. Flexible wages, prices, and interest rates always bring the economy back to full employment.**
2. **The price level will increase, but real national output will not change. According to the classical theory, increases in AD increase the price level only.**
3. **The price level will decrease, but output will stay the same. LRAS will determine the full-employment level of real national output while AD will establish the price level.**
4. **At full employment, output cannot increase regardless of changes in AD because the full amount of resources is already provided. However, LRAS can increase with sound growth policies.**

Part B. The Keynesian View

1. **Because resources are unemployed, increases in AD will result in a higher real national output without an increase in the price level.**
2. **The simple Keynesian model assumes the price level is fixed. This is not realistic because at least some inflation occurred every year with the exception of the Great Depression years.**
3. **Output will increase, but the price level will be unchanged. Output will increase as more resources are employed. Because unemployed resources are used, there will not be any upward pressure on prices.**
4. **Output will decrease, and the price level will be unchanged. With insufficient AD, resources become unemployed. Because prices and wages are downwardly rigid or inflexible, there will be no automatic adjustment back to full employment.**
5. **It is more likely to be horizontal during periods of unemployment because increases in AD will cause unemployed resources to be used instead of putting upward pressure on prices.**
6. **There are unemployed resources (land, labor, capital).**

Part C.

Answers will vary.

UNIT 3, LESSON 3

Equilibrium Domestic Output in the Keynesian Income-Expenditure Model

Introduction and Description

This lesson builds the Keynesian income-expenditure model. Until recently, this was the key model in macroeconomics; it is gradually being replaced with the aggregate demand and supply model. The most important limitation of the Keynesian model is that it is a fixed-price model. It cannot show changes in the price level. The most important benefit of the Keynesian model is its precision. Students can clearly see the effects of changes in consumption, investment, and government expenditures on the equilibrium level of income. The multiplier effect is also very apparent in the Keynesian model. The AD/AS model blurs some of these distinctions.

This lesson builds the model step-by-step as follows:

A. Consumption and savings schedules
B. Investment schedule
C. Multiplier
D. Equilibrium
    1. How it is achieved
    2. Changes in equilibrium
    3. Equilibrium vs. full-employment equilibrium

Probably most of the essay questions on the AP Exam can be answered by using the aggregate demand and supply model. However, multiple-choice questions will still cover important concepts developed in the Keynesian income-expenditure model. If you do not build all the blocks of the Keynesian model, be sure to cover marginal propensity to consume, marginal propensity to save, the multiplier, recessionary gap, and inflationary gap.

Objectives

1. Explain how consumption and saving are related to disposable income in the Keynesian model.
2. Describe and calculate from given data the marginal propensity to consume and the marginal propensity to save.
3. Distinguish between *autonomous consumption* and *induced consumption*.
4. Describe the simplified multiplier.
5. Given values for the marginal propensity to consume, calculate the values for the simplified multiplier.
6. Calculate the total spending that occurs from a given change in business or government spending when the MPC is known.
7. Given values of the simplified multiplier, calculate the change in spending that would occur from a given change in business or government spending.
8. Describe the aggregate expenditure function and explain each component of it.
9. Describe Keynesian equilibrium in words and diagrams.
10. Analyze how various events affect the consumption schedule, the investment schedule, and total aggregate expenditure.
11. Given data, identify recessionary and inflationary gaps.
12. Compare, contrast, and reconcile the Keynesian income-expenditure model with the aggregate supply and demand model.

Time Required

- Six class periods

Materials

1. Activities 24, 25, 26, 27, 28, and 29
2. Visuals 3.9, 3.10, 3.11, 3.12, and 3.13

Procedure

1. Review quickly from the previous unit how disposable income is derived from GDP.
2. Help students to see the reasonableness of the Keynesian belief that consumption rises

more slowly than income as disposable income increases. Do so by confronting them with the following challenge: Suppose you received disposable income (denoted *Y*) each year in the following amounts: $5,000; $10,000; $20,000; $50,000; $100,000; $500,000. Ask each student to write down how much he or she would spend on consumption (denoted *C*) and how much on savings (denoted *S*). Unless every student spends every dollar received, it will usually be apparent when you sum up individual students' responses into an aggregate level of consumption for the class at each level of income that the following will occur:

   a. *C* increases as *Y* increases.

   b. *C* increases less than *Y* increases.

   c. *S* increases as *Y* increases.

3. Explain that consumers' tendency to consume less than they can from the disposable income they receive affects society's ability to control the levels of its output, employment, and prices. To understand this statement, we must first describe this behavior on the part of consumers, called their *marginal propensity to consume*, in a way that permits us to use it.

   a. Write on the board the definition of the marginal propensity to consume (denoted MPC) as the fraction by which consumers change their consumption (denoted ΔC) as their disposable income changes (denoted ΔY). Like any other variable that can be expressed as a fraction, this definition can be expressed in symbols as follows: $\text{MPC} = \Delta C/\Delta Y$.

   b. Mention that just as the ability of consumers to spend from disposable income could be examined by examining saving, so too can the MPC from disposable income be examined by focusing on the marginal propensity to save (or $\text{MPS} = \Delta S/\Delta Y$).

4. Give students practice in understanding and calculating the MPC and MPS by having them complete Activity 24. Go over the answers.

5. Project Visual 3.9 and discuss the consumption and savings functions. Be sure to emphasize the factors that might cause the consumption schedule (and the corresponding saving schedule) to shift. These factors include changes in: wealth, the price level, consumer debt, consumer expectations, and taxation.

6. Have the students complete Activity 25 and discuss the answers. It would be best to make visuals of the graphs when discussing them.

7. Project Visual 3.10 and explain the investment function. Be sure to note that a fixed amount of investment has been added to consumption, and the equilibrium level of GDP is where $C + I$ intersects the 45° line.

8. Now discuss the factors that determine the level of investment spending. The basic determinants of investment spending are the expected rate of profit and real interest rates.

9. Have the students complete Activity 26 and discuss the answers.

10. Note that in Activity 26 a $100 billion increase in investment increased the equilibrium level of income by $200 billion. Tell students that this is the multiplier.

11. Expand the students' appreciation for the importance of the multiplier by tracing out for them on the board a sequence of exchanges that would occur in each of their neighborhoods if Robin Hood stopped by and donated $1,000 to each student. Assume each student has an MPC of .8.

    a. Put the following table headings on the board:

(Column 1) *Consumption*	*(Column 2)* *Additional Income*

    b. Place $1,000 under Column 2, representing the initial gift.

    c. Ask students how much they would

spend, given an MPC of .8, and write that number in Column 1. ($1,000 x .8 = $800)

d. Ask students how much income the recipient of the money they spent received, and write that amount in Column 2. ($800)

e. Ask how much of the new income the recipient will spend for consumption, and write that in Column 1. ($800 x . 8 = $640) Draw an arrow from the $800 in Column 2 to the $640 in Column 1 so that students can keep track of successive changes in income and consumption.

f. Repeat steps d and e sequentially until the additions to income and the additions to consumption both approach zero.

g. Have students sum each of the two columns.

h. Discuss conclusions suggested by the exercise:

   1) The sums for income and consumption appear to be approaching specific numbers.

   2) Income increases greater than consumption increases by an amount equal to the new income ($1,000) initially introduced by Mr. Hood into the neighborhood.

   3) Income and consumption both increase by a multiple of the original change in income.

   4) The MPC is important because it determines the size of the multiplier, which determines how much income increases. If this is not yet evident, have half of the students work through steps a-g above using an MPC of .9; have the others work through steps a-g using an MPC of .5.

i. Inform students that the simple multiplier works similarly on any change in new spending whether initiated by consumers, businesses, or government. The change in spending, however, must be autonomous.

12. Explain to the students that an algebraic formula has been developed that permits much quicker calculation for the amount by which total income changes when someone injects new spending into the economy. The formula, called the *multiplier*, is defined as follows:

    Multiplier = 1/(1 – MPC).

13. Demonstrate algebraically that the multiplier yields the same change in total income as students found earlier by using the following:

    a. An MPC of .8 [1/(1-MPC) = 1/(1-.8) = 1/.2 = 10/2 x $1,000 = $5,000].

    b. An MPC of .9 [1/(1-MPC) = 1/(1-.9) = 1/.1 = 10/1 x $1,000 = $10,000].

    c. An MPC of .5 [1/(1-MPC) = 1/(1-.5) = 1/.5 = 2/1 x $1,000 = $2,000].

14. Recall from the previous lesson that MPC + MPS = 1. Therefore, 1 – MPC = MPS. Thus, we can replace each denominator in step 13 above with MPS, allowing us to express the multiplier also in terms of the savings behavior of consumers as well as their consuming behavior (i.e., Multiplier = 1/MPS). Demonstrate this, using an MPC of .8, .9, and .5.

15. Have the students complete Activity 27 and discuss the answers.

16. Project Visual 3.11 and explain how the equilibrium level of domestic output (real GDP) is determined in the Keynesian model. Be sure to cover these points:

    a. The equilibrium level of output is that output (real GDP) where total spending is just sufficient to purchase that output. This is where *C* + *I* = 45° line.

    b. What would happen if *C* + *I* were initially greater than the equilibrium level of output?

    c. What would happen if *C* + *I* were initially less than the equilibrium level of output?

   d. What is the relationship between planned investment and actual investment?

17. Use Visual 3.12 to discuss a recessionary gap.

18. Use Visual 3.13 to discuss an inflationary gap.

19. Have the students complete Activity 28 and discuss the answers.

20. Give a lecture reconciling the AD/AS model and the Keynesian model. Cover these points:

    a. The Keynesian model is a fixed-price model while the AD/AS model is a variable-price model.

    b. A shift outward in the aggregate demand curve is the same as a shift upward in the aggregate expenditure curve.

    c. In the Keynesian model, the economy is on the horizontal portion of the aggregate supply curve.

    d. The Keynesian model cannot account for changes in aggregate supply. Therefore, it does not explain supply and shifts such as stagflation or the effect of productivity changes on real GDP.

21. Have the students complete Activity 29 and discuss the answers. Take a nap.

ACTIVITY 24 **ANSWER KEY**
What Is an MPC?

The marginal propensity to consume (MPC) is the *change* in consumption divided by the *change* in disposable income. It is the fraction of any change in disposable income that is spent on consumer goods.

The marginal propensity to save (MPS) is the fraction saved of any change in disposable income. The MPS is equal to the change in saving divided by the change in disposable income.

Using the data in the table *Marginal Propensity to Consume and to Save* calculate the MPC and MPS at each level of disposable income. The first one is completed as an example. This is not a typical consumption function. Its purpose is to provide practice in calculating MPC and MPS.

Marginal Propensity to Consume and to Save

Level of output and income (NNP = DI) (1)	Consumption (2)	Saving (1) - (2) (3)	Marginal propensity to consume (MPC) $\Delta(2)/\Delta(1)$ (4)	Marginal propensity to save (MPS) $\Delta(3)/\Delta(1)$ (5)
$12,000	12,100	-100		
			.9	.1
$13,000	13,000	0		
			.8	**.2**
$14,000	13,800	200		
			.7	**.3**
$15,000	14,500	500		
			.6	**.4**
$16,000	15,100	900		

1. If disposable income changes from $10,000 to $12,000 and consumption changes from $9,000 to $10,000:
   a. What is the MPC? **.5**
   b. What is the MPS? **.5**

2. Why do the MPC and MPS always equal one?
   Because income must either be spent on consumption or saved.

ACTIVITY 25 **ANSWER KEY**
The Consumption Function

In the nation of Chaos-on-the-Styx, the relationship between consumption expenditure and disposable income is shown in the table *Consumption Expenditure and Disposable Income.*

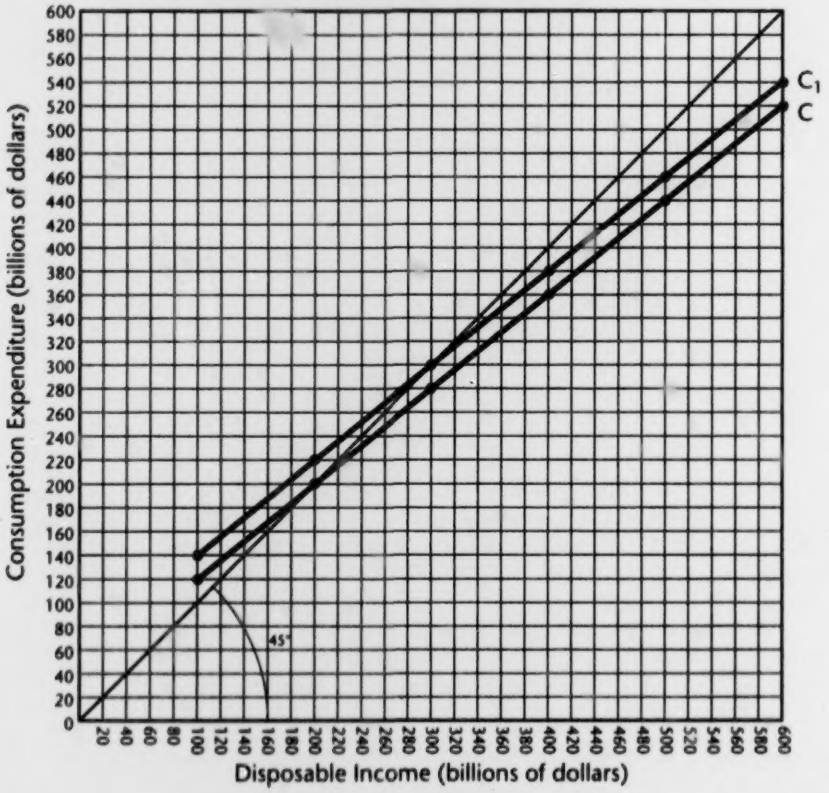
Consumption Expenditure and Disposable Income

Consumption expenditure (billions of dollars)	Disposable income (billions of dollars)	Savings (billions of dollars)
120	100	**-20**
200	200	**0**
280	300	**20**
360	400	**40**
440	500	**60**
520	600	**80**

1. a. Plot the consumption function for Chaos-on-the-Styx on the graph *Plotting the Consumption Function.* Label it C.

   b. At what level is consumption equal to disposable income? **$200**

Plotting the Consumption Function

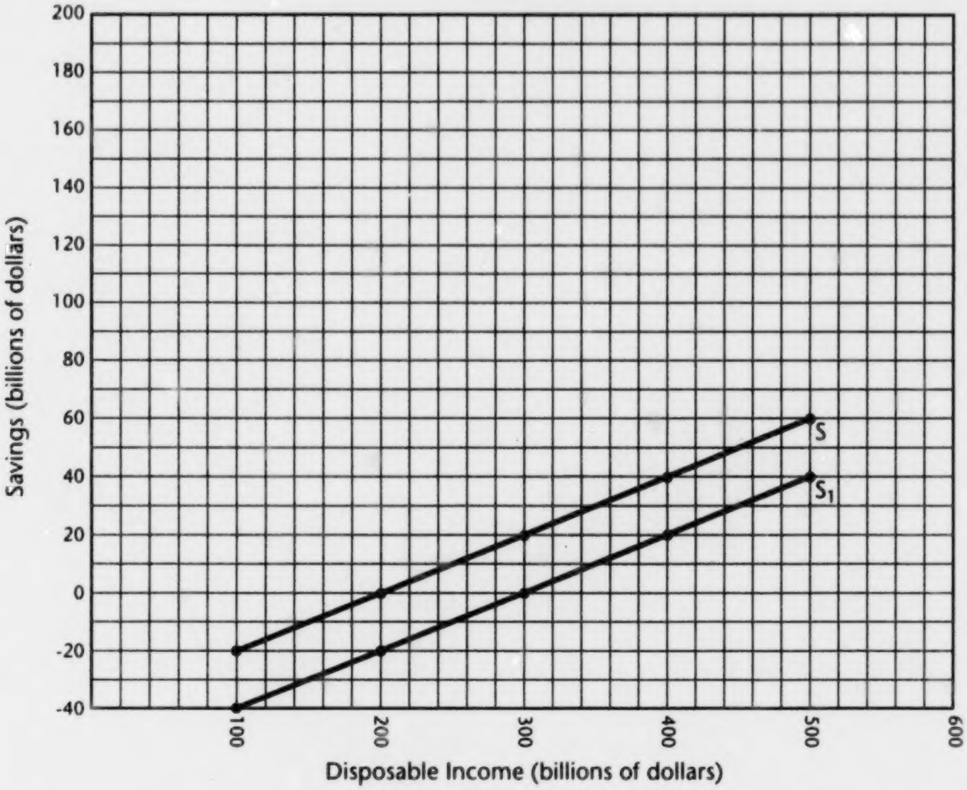


ACTIVITY 25 ANSWER KEY continued

2. a. Based on the data shown on the table *Consumption Expenditure and Disposable Income*, plot the savings function for Chaos-on-the-Styx on the graph *Plotting the Savings Function*. Label it *S*.

   b. At what level of disposable income is savings equal to zero? **$200**

Plotting the Savings Function



3. Now the nation of Chaos-on-the-Styx consumes *$20 billion more* at each level of disposable income that shows in the graphs you just completed.

   a. Plot the new consumption function on the graph *Plotting the Consumption Function*. Label it C_1. At what level is consumption equal to disposable income? **$300**

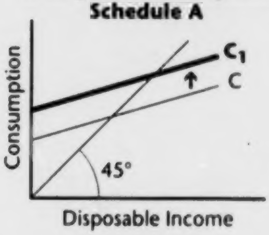
   b. Plot the new savings schedule on the graph *Plotting the Savings Function*. Label it S_1. At what level of disposable income is savings equal to zero? **$300**

ACTIVITY 25 ANSWER KEY continued

4. For each of the following events, write + in the answer blank at the left if it increased the consumption schedule or – if it decreased the consumption schedule. Then plot the change on the corresponding graph provided below. Each graph should show an increase or decrease compared to the original consumption schedule.

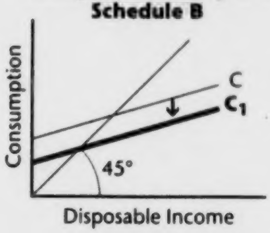
__+__ a. Development of consumer expectations that prices will be higher in the future.

Change in Consumption Schedule A



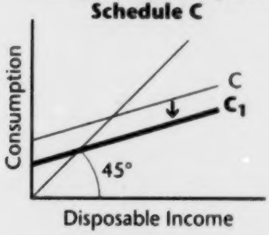
__–__ b. Gradual shrinkage in the quantity of real assets owned by consumers.

Change in Consumption Schedule B



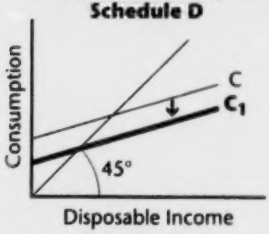
__–__ c. Increase in the volume of consumer indebtedness.

Change in Consumption Schedule C



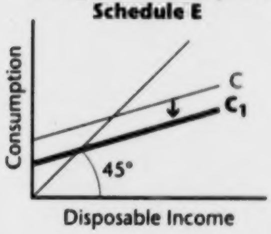
__–__ d. Growing belief that disposable income will be lower in the future.

Change in Consumption Schedule D



__–__ e. Rumors that a current shortage of consumer goods will soon disappear.

Change in Consumption Schedule E



ACTIVITY 26 **ANSWER KEY**

Plotting the Investment Function

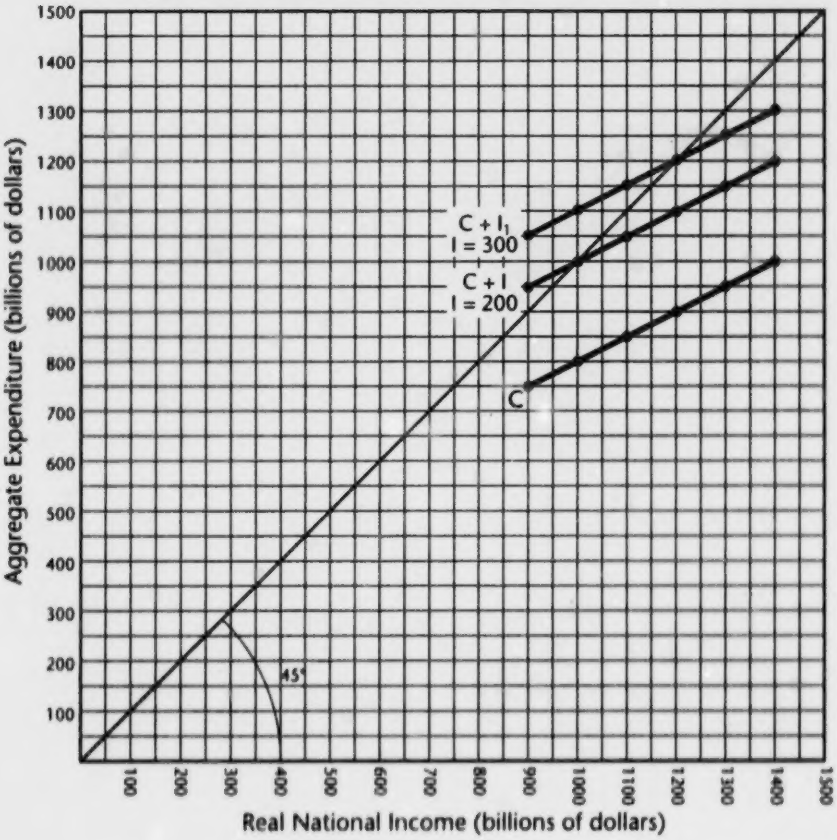
Assume that country XYZ has a consumption function as shown in the table *Consumption Function of Country XYZ*.

Consumption Function of Country XYZ
(all figures are in billions of dollars)

Real income	Consumption expenditure	Aggregate expenditure I = 200	Aggregate expenditure I = 300
900	750	950	1,050
1,000	800	1,000	1,100
1,100	850	1,050	1,150
1,200	900	1,100	1,200
1,300	950	1,150	1,250
1,400	1,000	1,200	1,300

1. Plot the consumption function on the graph *Plotting the Consumption Function of Country XYZ*. Label it C.

Plotting the Consumption Function of Country XYZ



ACTIVITY 26 ANSWER KEY continued

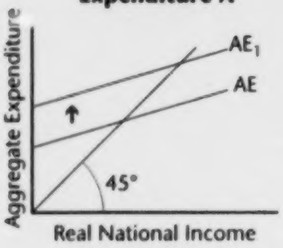
2. Plot the investment function (I) when I = 200. What is the equilibrium level of income? **$1,000**

3. Plot the investment function (I) when I = 300. What is the equilibrium level of income? **$1,200**

4. Now show graphically the effects of each of the following changes on aggregate expenditure. On each graph, show the original aggregate expenditure (label *AE*) and the new aggregate expenditure (label AE_1). It is the direction of the change that is important. The first change is illustrated for you.

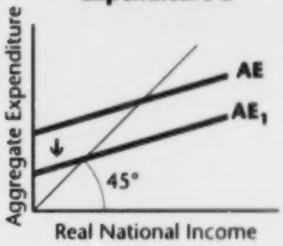
a. Congress cuts personal income taxes.

Change in Aggregate Expenditure A



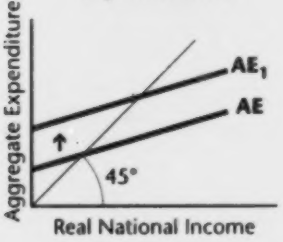
b. Business leaders believe that the economy is headed for a recession.

Change in Aggregate Expenditure B



c. Survey shows consumers are confident about the future of the economy.

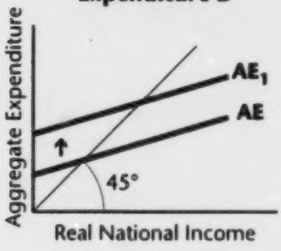
Change in Aggregate Expenditure C



ACTIVITY 26 ANSWER KEY continued

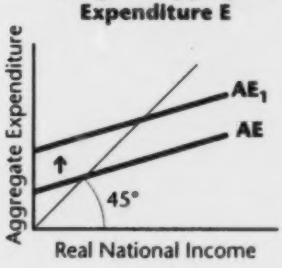
d. Economic booms in Japan and Europe increase demand for U.S. exports.

Change in Aggregate Expenditure D



e. Because of a reduction in the corporate income tax, businesses increase their investment in new plant and equipment.

Change in Aggregate Expenditure E



ACTIVITY 27 **ANSWER KEY**

The Magic of the Multiplier

Part A.

1. Would the multiplier be larger or smaller if people saved more of their additional income? **smaller**

2. a. What would happen to the multiplier if people saved all their income? **It would be 1**

   b. What would happen if people spent all their income? **It would be infinity**

3. Government spending has the same effect as investment spending. If the multiplier were 4, how much more would the government have to spend to increase aggregate demand by $1 million? **$250,000**

4. If the government needed to cut aggregate demand by $2 million and the multiplier were 4, how much would government spending have to be reduced? **$500,000**

5. How does the multiplier explain why changes in investment spending cause large fluctuations in GDP?
   Because increases in investment cause endogenous increases in consumption, the ultimate increase in GDP is larger than the initial increase in investment.

Part B. The Algebra of the Multiplier

1. What is the multiplier if the MPC is equal to 3/4? **4**
2. What is the multiplier if the MPC is equal to 9/10? **10**
3. What is the multiplier if the marginal propensity to save (MPS) is 1/5? **5**
4. Why is the multiplier important in understanding business cycles?

   It shows that investment or other autonomous spending is "power spending." It has a multiplied effect on the economy.

ACTIVITY 28 **ANSWER KEY**
Keynesian Equilibrium Without Government

These activities are designed to give you practice with manipulations of the income-expenditure diagram. They are based on data for real income (output), real consumption spending, and real investment spending given in the table *Income–Expenditure Schedule.*

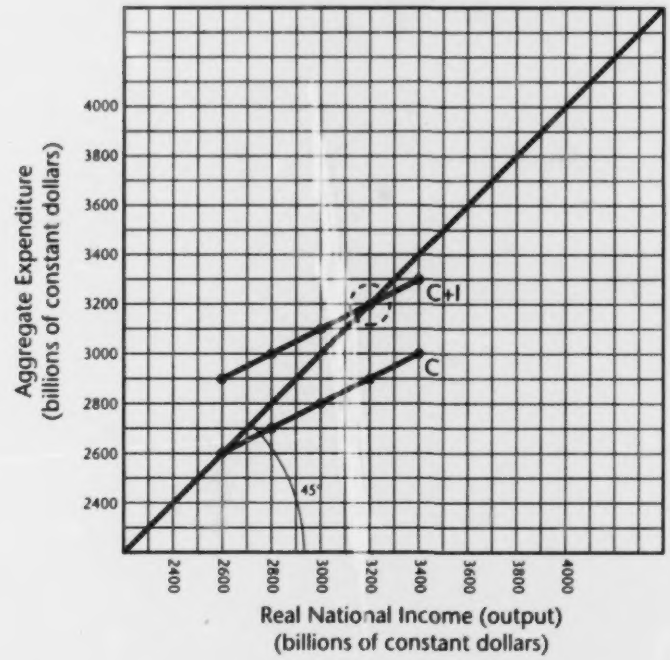
This Activity shows you how the expenditure schedule is derived and how it helps to determine the equilibrium level of income. For this Activity, it is assumed that prices are constant with the Consumer Price Index or price level having a value of 100. All figures in the table *Income–Expenditure Schedule* are in billions of constant dollars.

Caution: To get the correct answers for this Activity, you must use an aggregate expenditure rather than an aggregate demand diagram.

Income–Expenditure Schedule

Income (output)	Consumption spending	Investment spending	Total spending (aggregate expenditure)
2,600	2,600	300	**2,900**
2,800	2,700	300	**3,000**
3,000	2,800	300	**3,100**
3,200	2,900	300	**3,200**
3,400	3,000	300	**3,300**

Plotting Income–Expenditure



1. Use the data on consumption spending and income to draw the consumption function on the graph, *Plotting Income–Expenditure.* Label it C.

2. Using the consumption function you have just drawn and the data on investment spending, draw the expenditure schedule on the same graph. What is the difference between the expenditure schedule and the consumption function?
Investment spending – $300

3. Now draw a line representing all the points at which total spending and income could be equal. This is the 45° line.

4. The 45° line represents all the points that *could be* the equilibrium level of total spending. Now circle the one point that *is* the equilibrium level of total spending. What is the equilibrium level of total spending on your graph? **$3,200**

5. A recessionary or inflationary gap is measured vertically at the full-employment level of total spending. There is a recessionary gap if the actual level of total spending is less than the full-employment level of total spending. There is an inflationary gap if the actual level of total spending is greater than the full-employment level of total spending.

   Fill in the answer blanks or cross out the incorrect words in parentheses.

   a. Based on the data in the table *Income–Expenditure Schedule* and assuming that the full-employment level of total spending is $3,000 billion, the *(~~recessionary~~/inflationary)* gap of $ **100** .

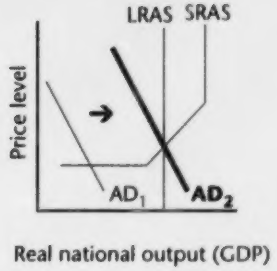
   b. Based on the data in the table *Income–Expenditure Schedule* and assuming that the full-employment level of total spending is $3,400 billion, the *(recessionary/~~inflationary~~)* gap of $ **100** .

ACTIVITY 29 **ANSWER KEY**

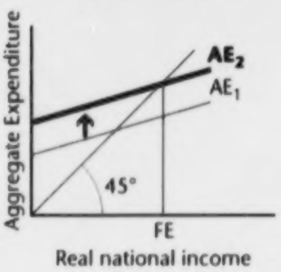
Reconciling the Keynesian Aggregate Expenditure Model with the Aggregate Demand and Supply Model

1. The economy is at less than full employment. An increase in consumer confidence moves the economy to full employment.

**Less Than Full Employment—
AD/AS Model**

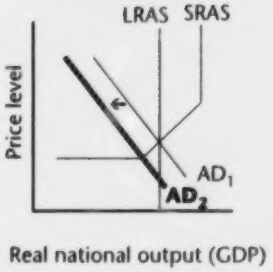

LRAS
SRAS
Price level
→
AD$_1$
AD$_2$
Real national output (GDP)

**Less Than Full Employment—
Keynesian Model**

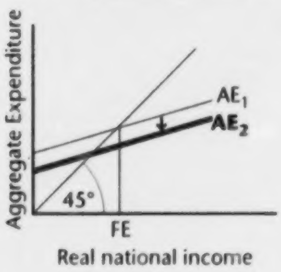

Aggregate Expenditure
AE$_2$
AE$_1$
↑
45°
FE
Real national income

2. The economy is at full employment but businesses begin to believe that a recession is ahead.

**Full Employment—
AD/AS Model**


LRAS
SRAS
Price level
←
AD$_1$
AD$_2$
Real national output (GDP)

**Full Employment—
Keynesian Model**


Aggregate Expenditure
AE$_1$
AE$_2$
↓
45°
FE
Real national income

430

UNIT 3, LESSON 4
Fiscal Policy

Introduction and Description

Keynesians argue that fiscal policy provides government with considerable power to alter real GDP, employment, and the price level. This lesson helps students see how government can use fiscal policy to stabilize the economy. It also helps students distinguish between automatic and discretionary stabilizers. The lesson starts simply, but the later Activities become more complex. Students should be able to illustrate the results of fiscal policy using either Keynesian equilibrium analysis or AD/AS analysis.

Objectives

1. Describe how fiscal policy can be used to try to stabilize the economy.
2. Distinguish between automatic (built-in) and discretionary stabilizers.
3. Distinguish between a *contractionary fiscal policy* and an *expansionary fiscal policy*.
4. Evaluate macroeconomic conditions and determine the fiscal policy that can improve those conditions.
5. List and explain complications encountered in employing fiscal policy.
6. Illustrate an expansionary fiscal policy using both the AD/AS model and the Keynesian model.
7. Illustrate a contractionary fiscal policy using both the AD/AS model and the Keynesian model.
8. Explain and show graphically how fiscal policy can be used to reduce any inflationary or recessionary gap.

Time Required

- Three class periods

Materials

1. Activities 30, 31, and 32
2. Visuals 3.14, 3.15, 3.16, and 3.17

Procedure

1. Introduce fiscal policy through a lecture, which should cover the following:
   a. A definition of *fiscal policy* as all the spending and taxing activities of the national government aimed at moving aggregate demand in a direction that permits output, employment, and price level goals to be met.
   b. The difference between expansionary and contractionary fiscal policy.
   c. The difference between discretionary and automatic stabilizers.
   d. How the multiplier affects fiscal policy.
2. Have students complete Activity 30. Discuss the answers.
3. Have students complete Activity 31. Discuss the answers. This might be a good time to reinforce the idea that the answers are based on the Keynesian demand management approach. Question 5 in Part B illustrates that stagflation *cannot* be explained by changes only in AD.
   a. The Keynesian approach has assumed that a tradeoff between unemployment and inflation is possible. When unemployment is too high, the goal is to increase AD enough to lower unemployment to an acceptable level without, at the same time, causing or aggravating inflation. When there is little unemployment and inflation prevails, the goal is to decrease AD and increase unemployment to levels that eliminate inflation (i.e., promote a stable price level). But the tradeoff between unemployment and inflation has not worked well since the beginning of the 1970s. Inflation has more or less persisted under conditions of both high and low unemployment. Consequently, it is understandable that critics of Keynesian policies have increased and new approaches have been put forward.

LESSON 4 continued

Question 5 in Part B of the Activity gives you the opportunity to present the views of economists whose names are associated with the principal alternative approaches or theories.

b. Advocates of the *rational expectations* approach argue that people come to expect changes in economic policy and act to offset the intended results of such changes. Example: if the economy goes into recession, people "expect" fiscal policies (say tax cuts) that are designed to stimulate business investment. Businesses will therefore refrain from investing until the tax cut takes place. Consequently, their actions while awaiting the tax cut may aggravate the recession and then create too strong a recovery in investment after the tax cut becomes effective. Advocates of the rational expectations approach claim that in this fashion recession and booms are exaggerated rather than smoothed out as a result of government policy.

c. Advocates of *monetarism* argue that steady economic growth and price stability can be achieved with a steady increase in the money supply of three to five percent a year. They contend the record shows that AD management does not achieve steady economic growth and price stability.

d. Advocates of *supply-side economics* believe fiscal policy should be designed to provide incentives to increase aggregate supply. They believe this can be accomplished by lowering taxes in order to encourage people to innovate more, start more businesses, invest more, and work harder—in short, to produce more because they may keep more of the income they receive.

4. Now illustrate fiscal policy with graphs.

   a. Visual 3.14 illustrates expansionary fiscal policy using AD/AS curves. Show the students that expansionary fiscal policy has different effects depending on which segment of the AS curve the economy is on.

   b. Visual 3.15 illustrates expansionary fiscal policy using the Keynesian model.

   c. Visual 3.16 illustrates contractionary fiscal policy using the AD/AS model.

   d. Visual 3.17 illustrates contractionary fiscal policy using the Keynesian model.

5. Have the students complete Activity 32. Discuss the answers. This activity reconciles the AD/AS model with the Keynesian model.

6. Now go back to Activities 30 and 31. Have the students go to the board and illustrate each situation with an AD/AS graph and a Keynesian income-expenditure graph. Ten graphs are possible in Activity 30, and 17 are possible in Activity 31. Question 5 in Part B of Activity 31 can be illustrated only by using an AD/AS model.

ACTIVITY 30 **ANSWER KEY**
Discretionary and Automatic Fiscal Policy

One of the goals of economic policy is to stabilize the economy. This means trying to keep employment stable at a high level and trying to keep prices from rising or falling significantly. To accomplish this, the amount of aggregate demand in the economy must be near the potential aggregate supply level of output. If aggregate demand is too low, there will be unnecessary unemployment. If aggregate demand is too high, there will be inflationary consequences.

If aggregate demand is too low, government may be able to stimulate spending in the economy by increasing its spending or by cutting taxes to encourage households and businesses to spend more. These policies are examples of *expansionary fiscal policy.* If government wants to slow down aggregate demand, it would pursue a *contractionary fiscal policy.* To do this, it could cut government spending or raise taxes. Fiscal policies can be discretionary or automatic.

If government has to pass a law or take some other specific action to change its tax and/or spending policies, then government is stabilizing the economy through *discretionary stabilizers.* If the policy change happens by itself as the economic situation changes, then it is known as an *automatic stabilizer.* An example of an automatic stabilizer would be unemployment compensation. If the economy goes into a recession and people are laid off, they may be eligible to receive unemployment compensation. This payment helps them buy necessities for the family and helps keep aggregate demand from falling as much as it might otherwise. Thus, the payments help stabilize the economy.

Listed below are several fiscal policy actions. For each action listed, indicate whether it is an example of expansionary (*E*) or contractionary (*C*) fiscal policy and whether it represents an automatic (*A*) or discretionary (*D*) stabilizer.

Government Action	Expansionary (*E*) or Contractionary (*C*)	Automatic (*A*) or Discretionary (*D*)
Sample: Recession raises amount of unemployment compensation.	*E*	*A*
1. Cuts personal income tax rates.	**E**	**D**
2. Eliminates favorable tax treatment on long-term capital gains.	**C**	**D**
3. Incomes rise; as a result, people pay a higher fraction of their income in taxes.	**C**	**A**
4. As a result of a recession, more families qualify for food stamps and welfare benefits.	**E**	**A**
5. Eliminates the deductibility of interest expense for tax purposes.	**C**	**D**
6. Launches a major new space program to explore Mars.	**E**	**D**
7. Raises Social Security taxes.	**C**	**D**
8. Corporate profits increase; as a result, government collects more corporate income taxes.	**C**	**A**
9. Raises corporate income tax rates.	**C**	**D**
10. Gives all its employees a large pay raise.	**E**	**D**

ACTIVITY 31 **ANSWER KEY**
The Tools of Fiscal Policy

Part A.

1. The government cuts business and personal income taxes and increases its own spending.
   ***Expansionary.* A personal tax cut increases consumer demand. A business tax cut increases investment demand. An increase in government spending increases government demand.**

2. The government increases the personal income tax, Social Security tax, and corporate income tax. Government spending stays the same.
   ***Contractionary.* The tax increases reduce consumer and investment demand. Government demand remains the same.**

3. Government spending goes up while taxes remain the same.
   ***Expansionary.* Higher government spending without a corresponding rise in tax receipts increases total demand in the economy.**

4. The government reduces the wages of its employees while raising taxes on consumers and business. Other government spending remains the same.
   ***Contractionary.* Lowering government employees' wages decreases government demand. Higher taxes decrease consumer and investment demand.**

Part B.

Effects of Fiscal Policy

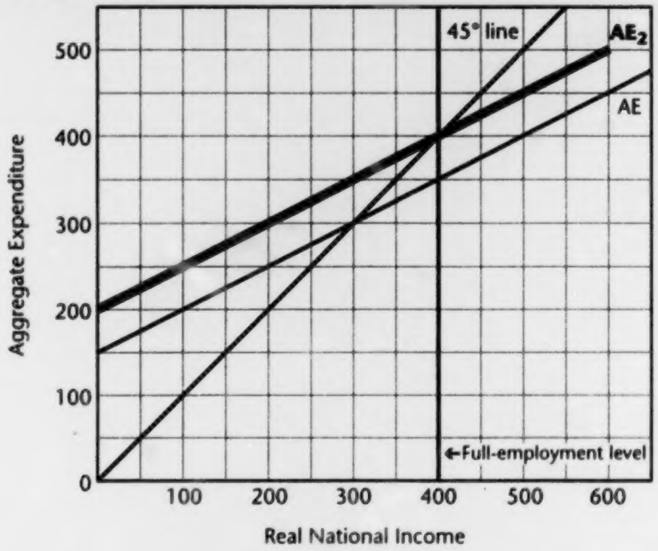
	(A) Objective for Aggregate Demand	(B) Action on Taxes	(C) Action on Government Spending	(D) Effect on Budget
1. The national unemployment rate rises to 12 percent.	**increase**	**decrease**	**increase**	**toward deficit**
2. Inflation is strong and its rate is now 14 percent per year.	**decrease**	**increase**	**decrease**	**toward surplus**
3. Surveys show consumers are losing confidence in the economy, retail sales are weak, and business inventories are increasing rapidly.	**increase**	**decrease**	**increase**	**toward deficit**
4. Business sales and investment are expanding rapidly, and economists believe strong inflation lies ahead.	**decrease**	**increase**	**decrease**	**toward surplus**
5. Inflation persists while unemployment stays high.	**This question is designed to show that traditional fiscal policy doesn't provide solutions to the problems presented by the simultaneous presence of inflation and excessive unemployment. Use this question to examine the principal alternatives to demand management economics, which are given in the discussion above.**			

ACTIVITY 32 **ANSWER KEY**

Two Ways to Analyze Fiscal Policy

The graph *Aggregate Expenditure Function for a Hypothetical Economy* shows an estimated full-employment national income of 400. A horizontal *SRAS is* assumed.

Aggregate Expenditure Function for a Hypothetical Economy



1. What will be the actual national income level in equilibrium? **300**

2. The recessionary gap is **50**.
   (Measure the gap vertically at full employment.)

3. How much of an increase in aggregate expenditure would be needed to eliminate the recessionary gap? **50**

4. How much will GDP increase if aggregate expenditure increases by $50 billion?
   $100 billion Why? **Because the multiplier is 2.**

5. What fiscal policy measures are available to deal with this situation?
   Decrease taxes or increase government spending.

6. Draw in a new AE curve showing the elimination of the recessionary gap through the use of fiscal policy.

ACTIVITY 32 ANSWER KEY continued

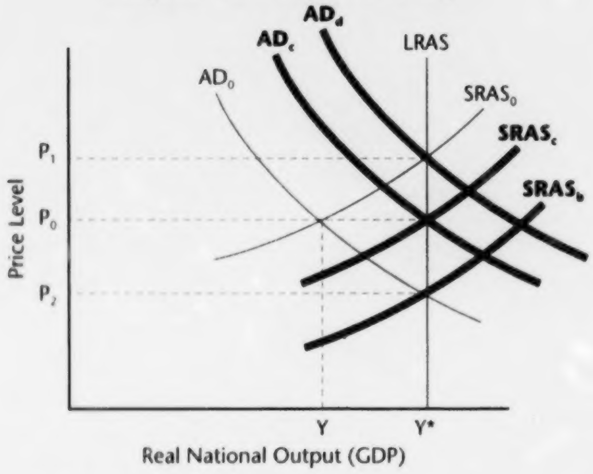


Diagram of a Persistent Gap

7. Assume a persistent *(~~inflationary~~/recessionary)* gap as shown by the diagram *Diagram of a Persistent Gap.*
   a. One possible way of eliminating the gap is through a shift in aggregate supply with decreasing factor prices. Show diagrammatically that this could eliminate the gap. Label the new curve $SRAS_b$. The new price level would be **P_2**.
   b. A second possibility would be to depend on a lesser shift of supply and have a modest shift in demand (naturally, or more likely, by discretionary fiscal stimulus) such that the price level was maintained at P_0. Show this diagrammatically. Label the curves $SRAS_c$ and AD_c.
   c. A third possibility is that government would seek changes in taxes and/or expenditures that would rapidly bring the economy to full employment. Show this diagrammatically. Label the curve AD_d.

8. Assume that a hypothetical economy is currently at an equilibrium national income level of $1,000 billion, but the full-employment national income is $1,200 billion. Assume the government's budget is currently in balance at $200 billion and the marginal propensity to consume is .75. Fill in the answer blanks or cross out the incorrect words in parentheses.
   a. The recessionary gap is **50**. (Measure the gap vertically at full employment.)
   b. The value of the multiplier is **1 ÷ .25 = 4**.
   c. Aggregate expenditures would have to be *(increased/~~decreased~~)* by **50** billion to eliminate the *(~~inflationary~~/recessionary)* gap.
   d. The government could attempt to eliminate the gap by holding taxes constant and *(increasing/~~decreasing~~)* expenditures by **50** billion. (Hint: not all of the tax change will come from consumption.)
   e. Alternatively, the government could attempt to eliminate the gap by holding expenditures constant and *(~~increasing~~/decreasing)* its tax receipts by **66.6** billion.
   f. As a third policy option, the government could propose a balanced budget *(increase/~~decrease~~)* of **200** billion.

UNIT 3, LESSON 5

Analyzing the Macroeconomy

Introduction and Description

The purpose of this lesson is to give students practice in analyzing the economy using the tools they have developed in this unit. Several of the questions in Activity 33 require them to use AD/AS graphs or Keynesian aggregate expenditure graphs. Beginning in May 1996, students will be required to interpret, use, and draw graphs on the AP Test.

Objectives

1. Analyze macroeconomic concepts and policy actions using the AD/AS and Keynesian models.
2. Draw graphs to illustrate macroeconomic problems as well as fiscal policy measures designed to correct these problems.

Time Required

- One class period if the Activity is completed as homework or two class periods if it is completed in small groups.

Materials

Activity 33

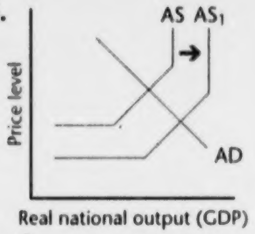
Procedure

1. Assign Activity 33 as homework or to be completed in small groups.
2. Discuss the answers to Activity 33.

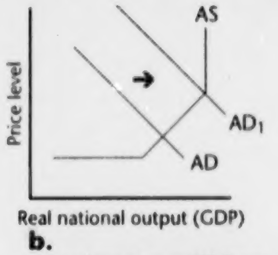
ACTIVITY 33 **ANSWER KEY**

Analyzing the Macroeconomy

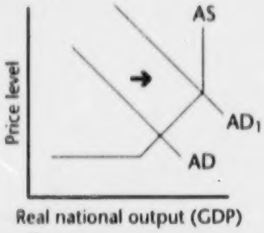
1. ***False.*** **At a level higher than full-employment output, the AS curve is vertical. Because output cannot be increased, only the price level will rise.**
2. ***False.*** **If prices rise more than wages, real income decreases. Increases in nominal income will increase AD, but at levels higher than full employment only the price level will increase.**
3. **There was a decrease in AS caused by increases in oil prices. A decrease in AS will increase the price level and decrease real national output.**
4. **Actually, sticky wages and prices make it more difficult for the economy to respond to decreases in AD. The classical theory maintained that lower wages and prices will stimulate aggregate quantity demanded and return the economy to full employment.**
5. ***False*** **for the same reason as question 1. The middle segment of the AS curve shows that prices will rise as full employment is approached.**
6.



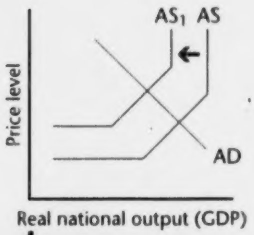
a.
Lower energy costs increase AS.



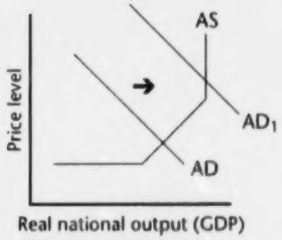
b.
Foreigners will buy more U.S. goods as they become relatively less expensive when compared to foreign goods.



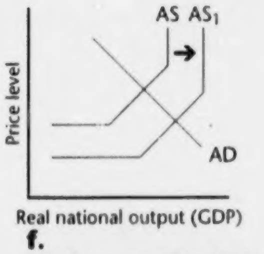
c.
Increased government spending stimulates AD.



d.
Capital is destroyed thereby decreasing productivity and therefore AS. This could also be illustrated by decreasing long-run AS.



e.
Too much money is chasing too few goods.

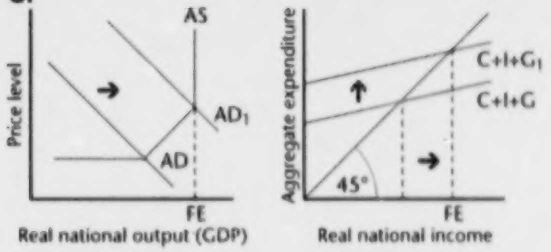


f.
Higher productivity increases output using the same resources.

ACTIVITY 33 ANSWER KEY continued

7. ***False*****. The nation's production possibilities frontier moves outward when a nation finds more resources or develops new technologies. This is the same thing as the long-run aggregate supply curve moving outward.**

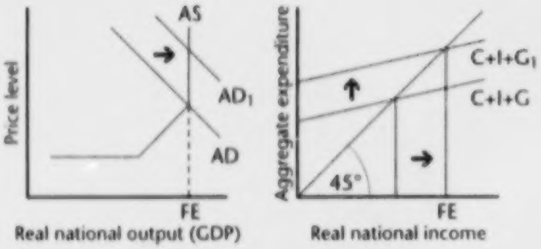
8.



AS
Price level
➔
AD₁
AD
FE
Real national output (GDP)
Aggregate expenditure
C+I+G₁
C+I+G
↑
➔
45°
FE
Real national income

a.

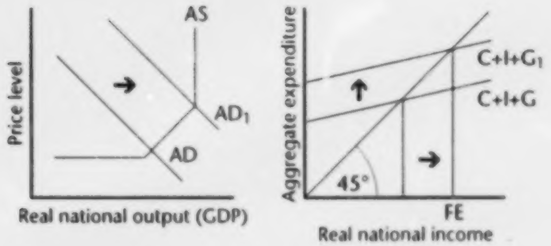
Lower taxes increase disposable income which increases consumption. Higher consumption increases AD or AE.



AS
Price level
➔
AD₁
AD
FE
Real national output (GDP)
Aggregate expenditure
C+I+G₁
C+I+G
↑
➔
45°
FE
Real national income

b.

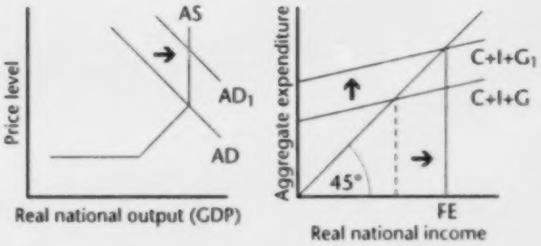
Higher government spending increases AD or AE. Because the economy is at full employment, output cannot increase, but the price level does.



AS
Price level
➔
AD₁
AD
Real national output (GDP)
Aggregate expenditure
C+I+G₁
C+I+G
↑
➔
45°
FE
Real national income

c.

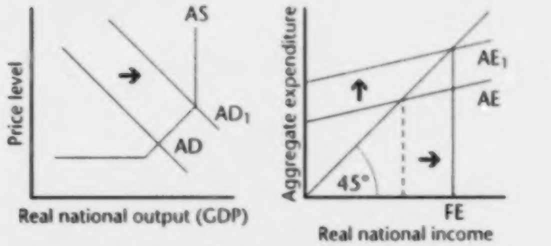
Because all the increase in government spending increases AD while only part of the tax increase comes from consumption, AD will increase. Part of the tax increase will come from savings. This is the balanced budget multiplier.



AS
Price level
➔
AD₁
AD
Real national output (GDP)
Aggregate expenditure
C+I+G₁
C+I+G
↑
➔
45°
FE
Real national income

d.

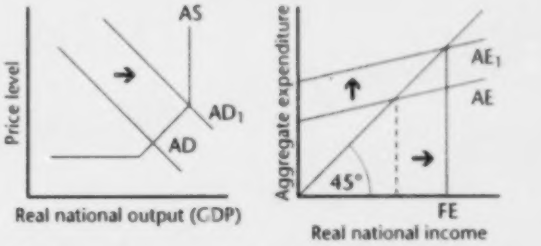
AD would increase because of higher government expenditures. If taxes were not increased, there would be no decrease in AD so net AD would increase. At full employment, increasing AD will only increase the price level.



AS
Price level
➔
AD₁
AD
Real national output (GDP)
Aggregate expenditure
AE₁
AE
↑
➔
45°
FE
Real national income

e.

Higher government expenditures increase the new AD, which will increase real GDP. If equilibrium goes beyond full employment, there will be significant inflation.



AS
Price level
➔
AD₁
AD
Real national output (GDP)
Aggregate expenditure
AE₁
AE
↑
➔
45°
FE
Real national income

f.

The increase in government spending would increase AD and AE, which would increase output and the price level.

Answers to Sample Multiple-Choice Questions

1. b
2. c
3. b
4. d
5. a
6. b
7. c
8. c
9. d
10. b
11. c
12. e
13. c
14. d
15. e
16. c
17. c
18. c
19. d
20. b
21. e
22. d
23. b
24. b
25. b
26. d
27. a
28. e
29. b
30. a

Answers to Sample Short Essay Questions

1. The "mystery" would be solved if the increases in the overall price level in the 1960s were caused primarily by increases in aggregate demand and the increases in the overall price level in the 1970s were caused primarily by decreases in the short-run aggregate supply curve.

   In the 1960s case of demand-pull inflation, increases in AD would increase the short-run equilibrium rate of real output as well as the overall price level. This increase in real output would be associated with a decrease in unemployment.

   In the 1970s, decreases in short-run AS caused output to fall and prices to rise. This was called cost-push inflation.

2. a. It meant that individuals and institutions had "paper losses" of a trillion dollars.

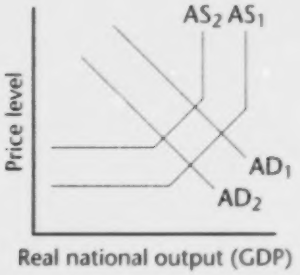
   b. This could decrease aggregate demand because if people felt they were poorer, they would cut back consumption spending. If businesses felt the stock market drop might cause a recession, they might cut back on investment. Again, AD would fall.

   A decrease in AD should decrease output and employment. It should also decrease the price level.

3. Investment spending is autonomous spending and is much less stable than consumption. Because of the multiplier, this would have a multiplied effect on GDP.

4. The economy was on a steeper portion of its aggregate supply curve in 1981. If the economy is operating closer to capacity, increases in aggregate demand will not be able to cause output to rise. Instead, the price level might rise.

5.



The tax increase would decrease aggregate demand because disposable income would be lower. This would cause prices to decrease but would also cause output to decrease. Too high a reduction in AD could cause a recession. If higher taxes reduced people's incentives to work, save, and invest, aggregate supply could decrease. For these reasons, it is possible that aggregate supply would also change under specific assumptions. This would cause both a higher price level and lower output.

6. Automatic stabilizers cause changes in aggregate demand without new laws being passed by Congress. Students were asked to describe three automatic stabilizers. Four possible answers are:

   a. Social Security maintains the incomes of retired people during a recession. Total income does not fall as much as it otherwise might. Social Security didn't exist at the beginning of the Great Depression.

   b. Unemployment compensation keeps the incomes of unemployed workers from going to zero. Although AD would be reduced, it would not be reduced by as large an amount as it was during the Great Depression.

   c. Farm support programs maintain farm income during recessions.

   d. The progressive income tax allows people to keep a larger percentage of their incomes when incomes decline.

ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

7. Businesses and workers would be paid to expand the factory. Part of this new income would be spent on new goods and services, and part of it would be saved. The additional spending would be income for the people who made these goods and services. These people would spend part of this income and save part of it. The part they spend would become income for other people. In each round the part that is saved is removed from the income stream. Therefore, the multiplier is the reciprocal of the fraction of the additional income that is saved (marginal propensity to save). The larger the marginal propensity to consume, the larger the total effect on spending.

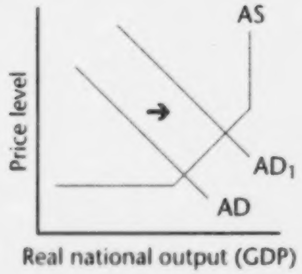
Answers to Sample Long Essay Questions

1. a. There is a recession. Real GDP is down, and unemployment is up. Prices increased by only four percent during the last year.

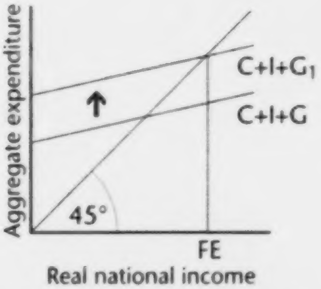
   b. The goal would be to increase real GDP and reduce unemployment without causing an increase in the inflation rate.

   c. Answers will vary. People who believe government is too big would reduce taxes. Others might increase government spending. Because not all of a tax decrease is spent, increases in government spending would cause a greater increase in AD than would a tax cut. A tax cut might cause an increase in AS. In either case, the federal deficit would become larger.

   d.



   e.

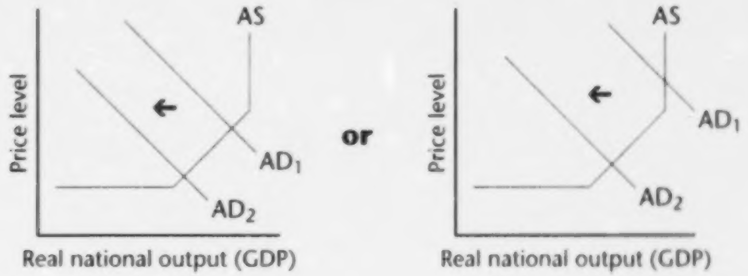


2. a. The main economic problem is inflation. The inflation rate for the past year was 18 percent. The economy is growing and the unemployment rate is declining.

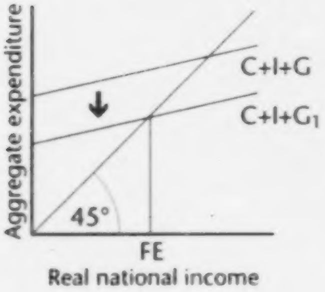
   b. Decrease the rate of inflation without causing a recession.

   c. Increase business and personal taxes, reduce government spending, or do both. This should put the federal government's budget into surplus or at least reduce the deficit.

   d.



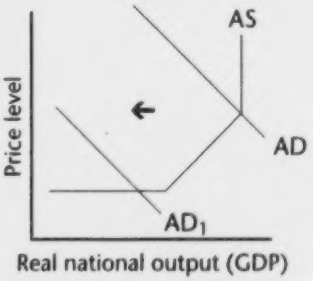
   e.



ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

3. a. The decline in consumption expenditures at each and every level of income will create a recessionary gap at the full-employment level of output. As a result of this autonomous change in aggregate expenditure, the following will occur:

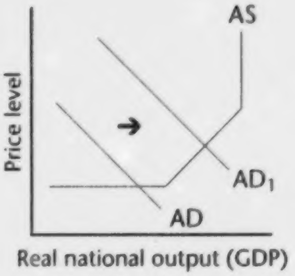
   1) Output will decline.
   2) Employment will decrease; unemployment will increase.
   3) The rate of increase in the price level will decline.



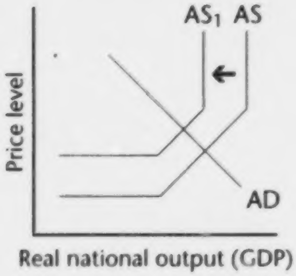
b. Fiscal policy alternatives and their effects might include two of the following: decrease taxes, increase government spending, simultaneously increase government spending and decrease taxes, and an equal increase in government spending and taxes.

These policies would have the following effects:

1) Output would increase.
2) Employment would increase.
3) The price level would increase.

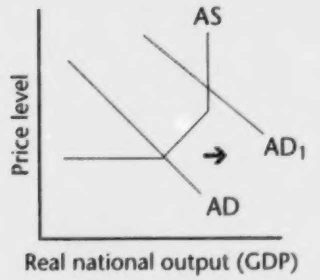


4. a. Increased environmental regulations decrease AS and cause inflation to occur simultaneously with an unacceptably high rate of unemployment and a negative rate of GDP growth. The economy is suffering from stagflation.

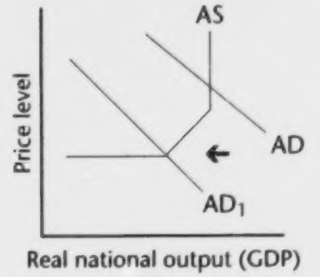


ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

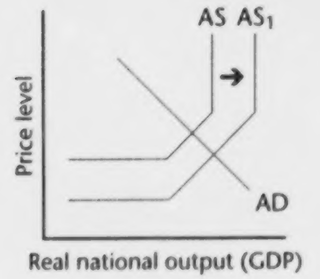
b. 1) Increased government expenditures (expansionary) will have these effects:
  - i) Output will increase.
  - ii) Employment will increase.
  - iii) The price level will increase; inflation will be further aggravated.


AS
Price level
→
AD₁
AD
Real national output (GDP)

2) Increased personal income taxes (contractionary) will have these effects:
  - i) Output will decline.
  - ii) Employment will decline.
  - iii) Inflation will decrease.

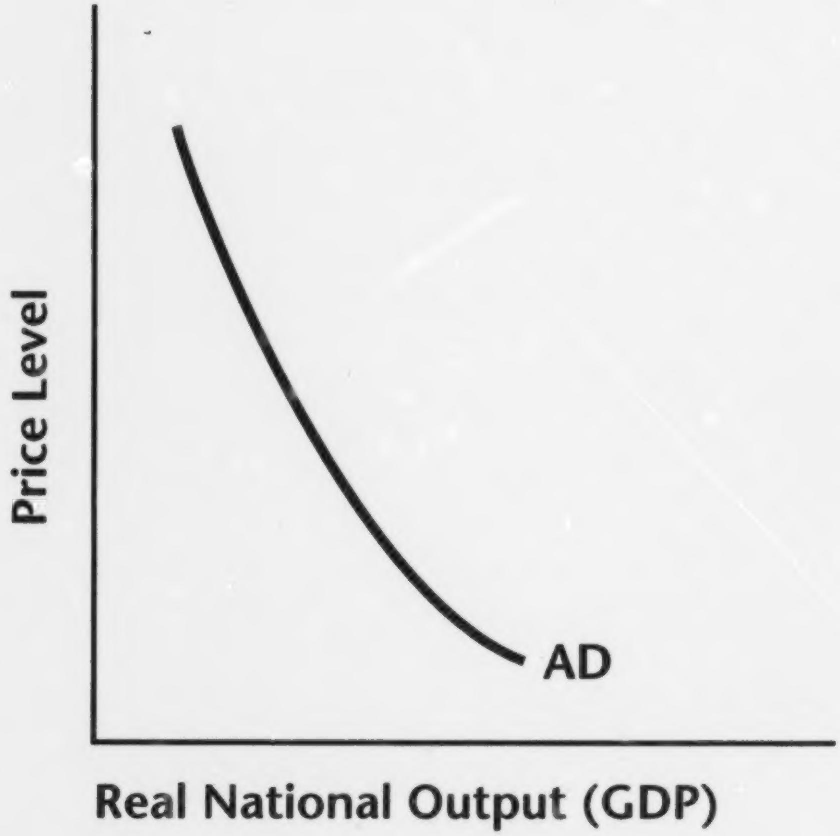

AS
Price level
←
AD
AD₁
Real national output (GDP)

3) Decreased business taxes and regulations (supply-side policy) will have the following effects:
  - i) Output will increase if business expectations are positive.
  - ii) Employment will increase if business expectations are positive.
  - iii) The rate of increase in the price level will fall as AS increases.


AS AS₁
→
Price level
AD
Real national output (GDP)

Visual 3.1

The Aggregate Demand Curve

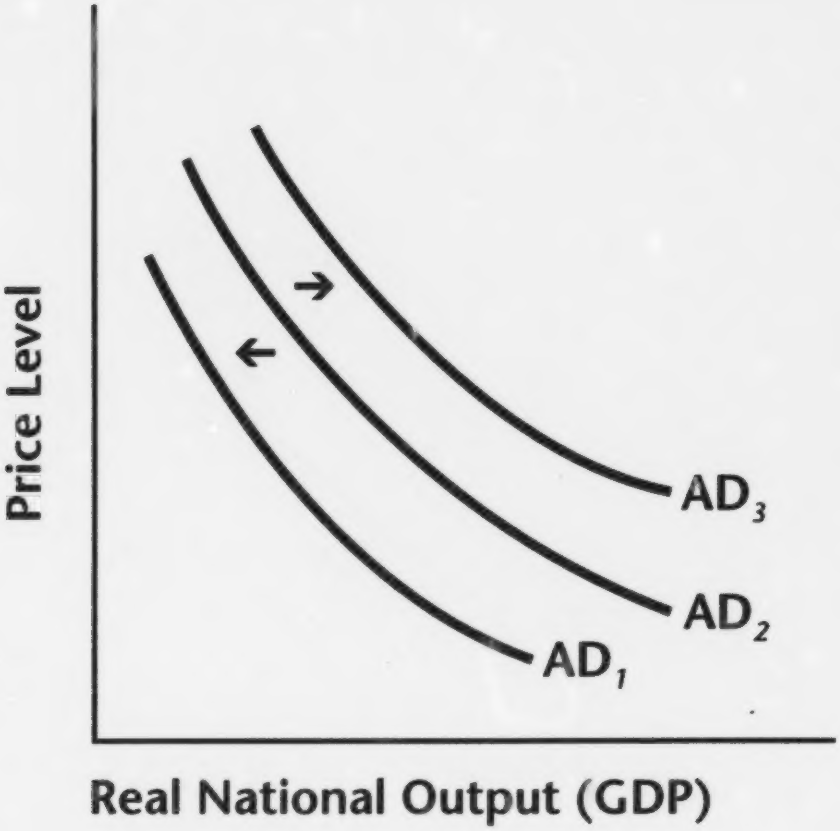


1. What does the aggregate demand curve illustrate?
2. Why is the aggregate demand curve downsloping?

From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

Visual 3.2

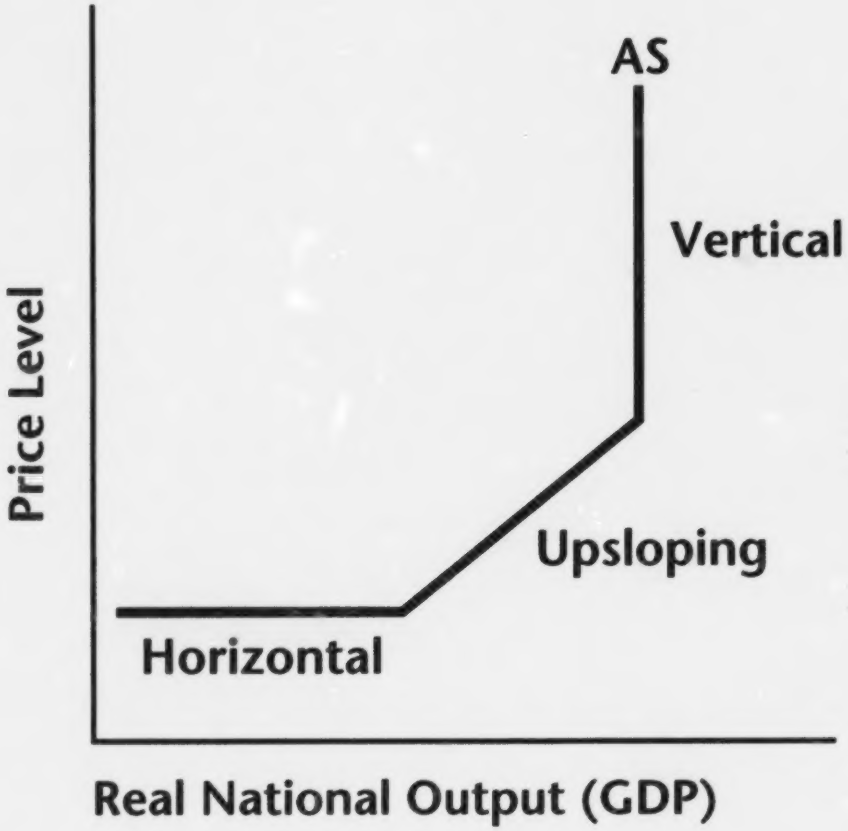
Shifts in Aggregate Demand



1. What factors can cause the aggregate demand curve to shift rightward, or increase?
2. What factors can cause the aggregate demand curve to shift leftward, or decrease?

Visual 3.3

The Aggregate Supply Curve



Why does the aggregate supply curve have three distinct ranges?

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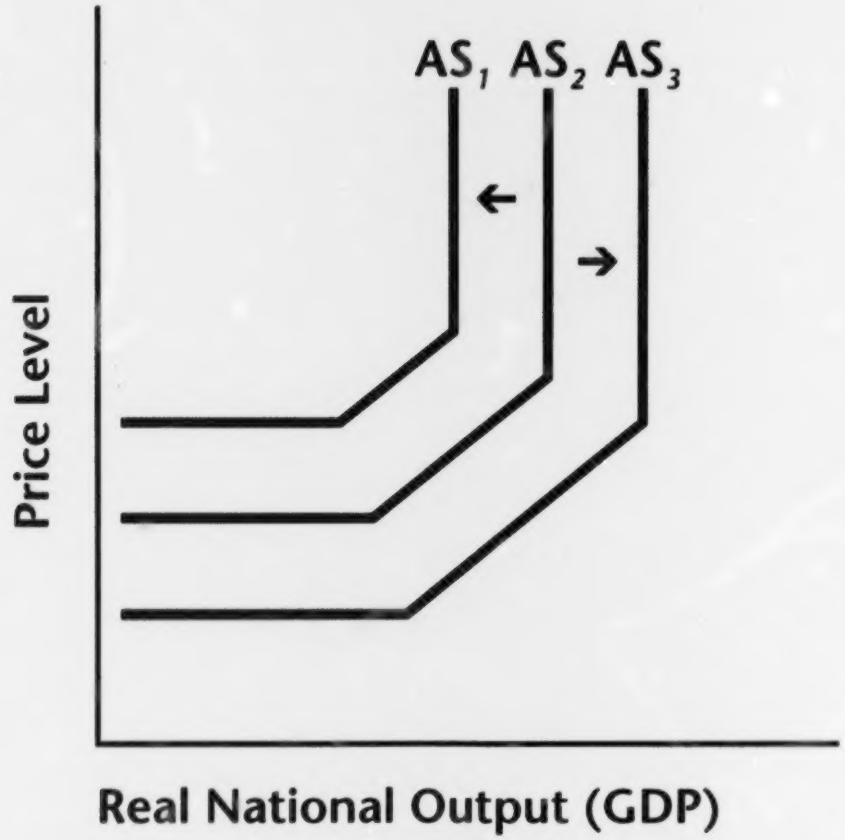
Visual 3.4

Shifts in Aggregate Supply



1. What can cause the aggregate supply curve to shift rightward, or increase?
2. What can cause the aggregate supply curve to shift leftward, or decrease?

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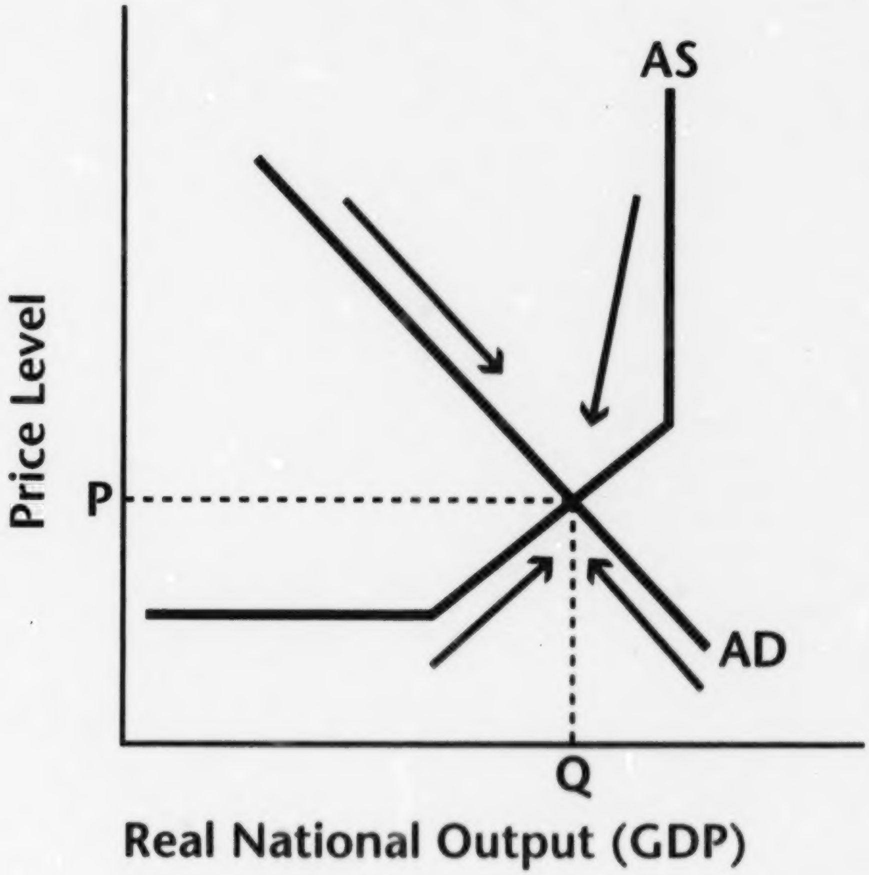
Visual 3.5

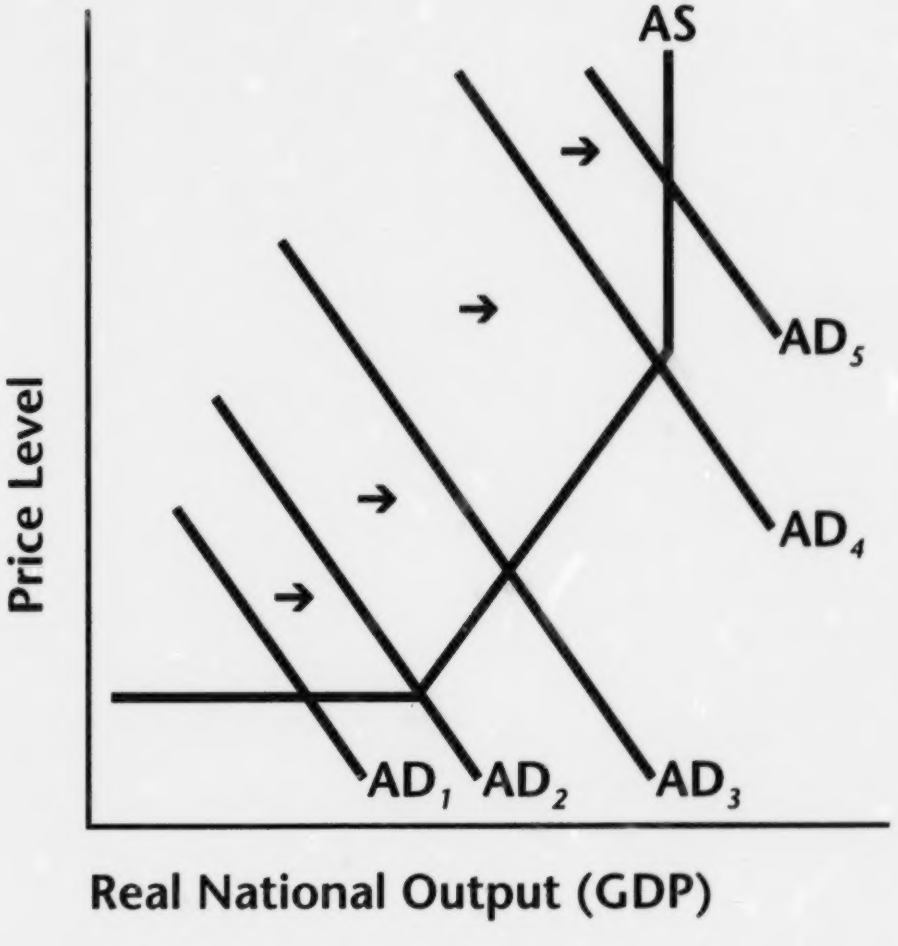
The Equilibrium Price Level and Output



1. What would happen if the initial price level were higher than P?
2. What would happen if the initial price level were lower than P?
3. Why is the equilibrium price level and real national output where aggregate demand and aggregate supply intersect?

Visual 3.6

The Effects of Shifts in Aggregate Demand


AS
AD$_5$
AD$_4$
AD$_1$
AD$_2$
AD$_3$
Price Level
Real National Output (GDP)

What determines whether a shift in aggregate demand changes output, the price level, or both?

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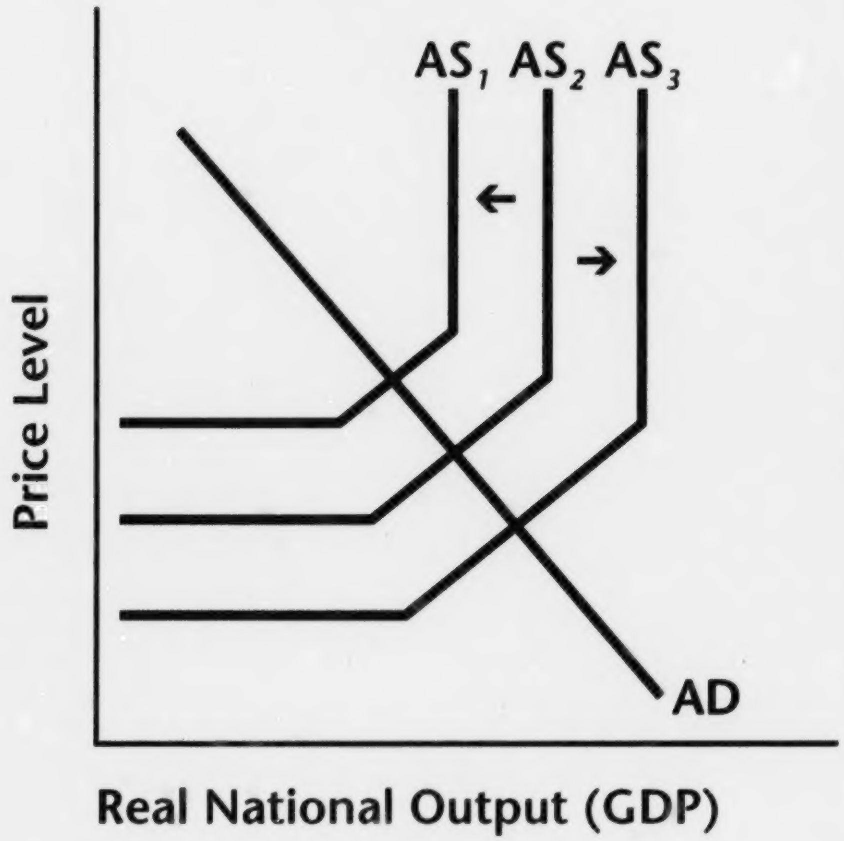
Visual 3.7

The Effects of Shifts in Aggregate Supply



1. What effect does a decrease in aggregate supply have on the price level and real national output?
2. What effect does an increase in aggregate supply have on the price level and real national output?

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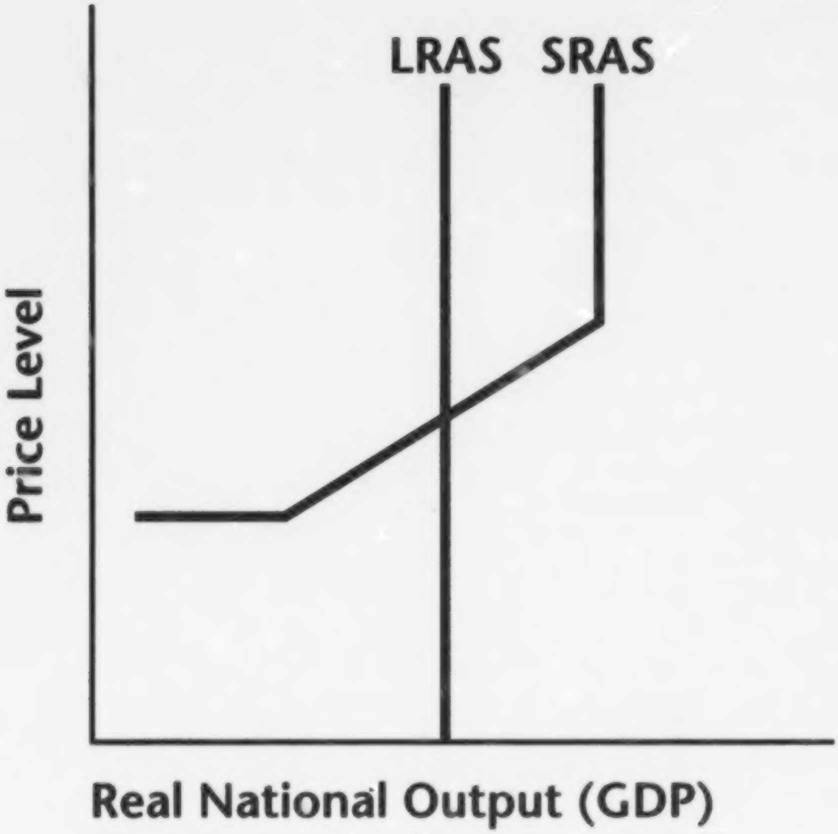
Visual 3.8

Long-Run Aggregate Supply



1. How can short-run aggregate supply be greater than long-run aggregate supply?
2. What factors can shift the long-run aggregate supply curve outward?

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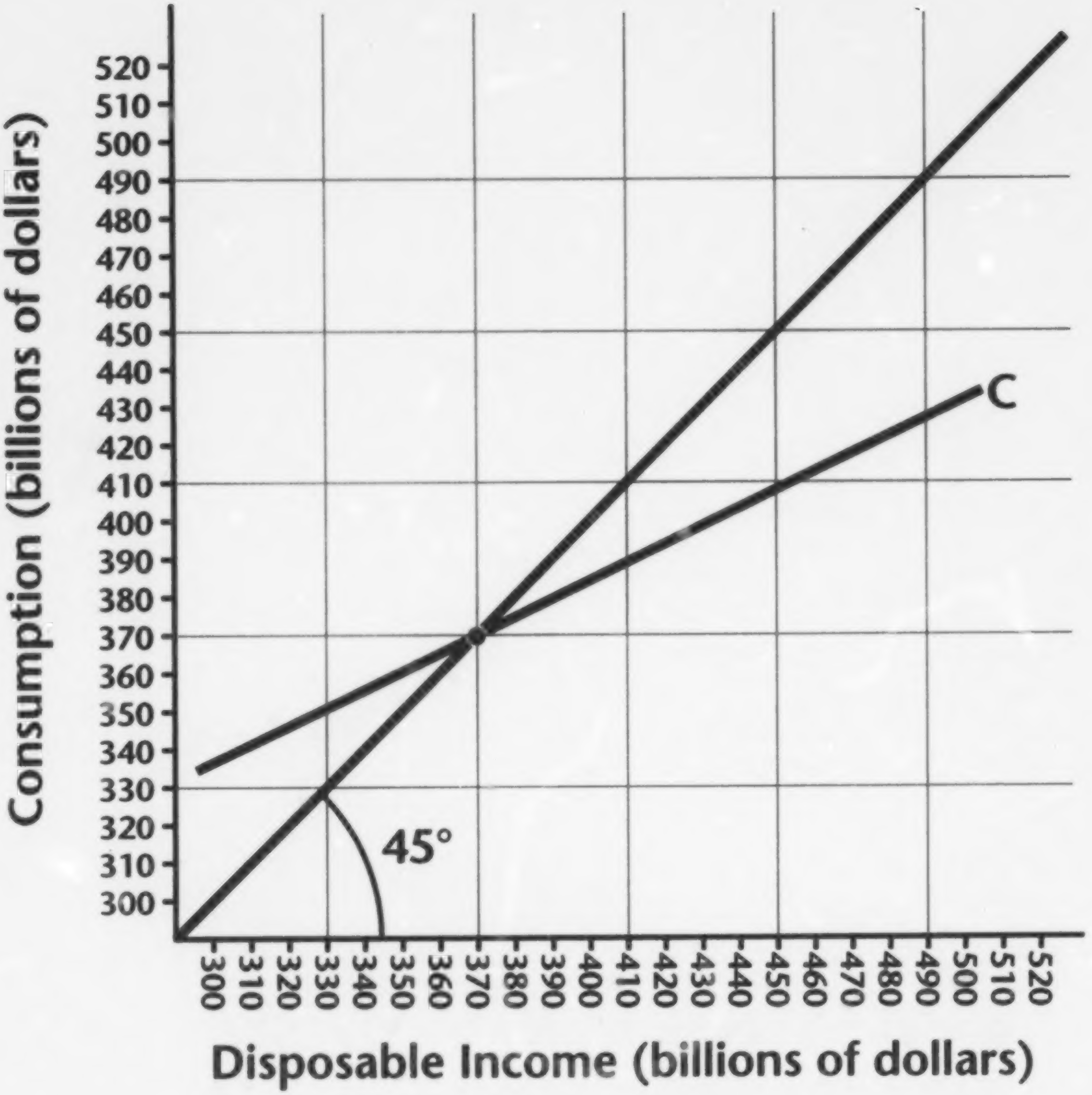
Visual 3.9

The Consumption Schedule



At what level of disposable income is there no savings, or dissavings?

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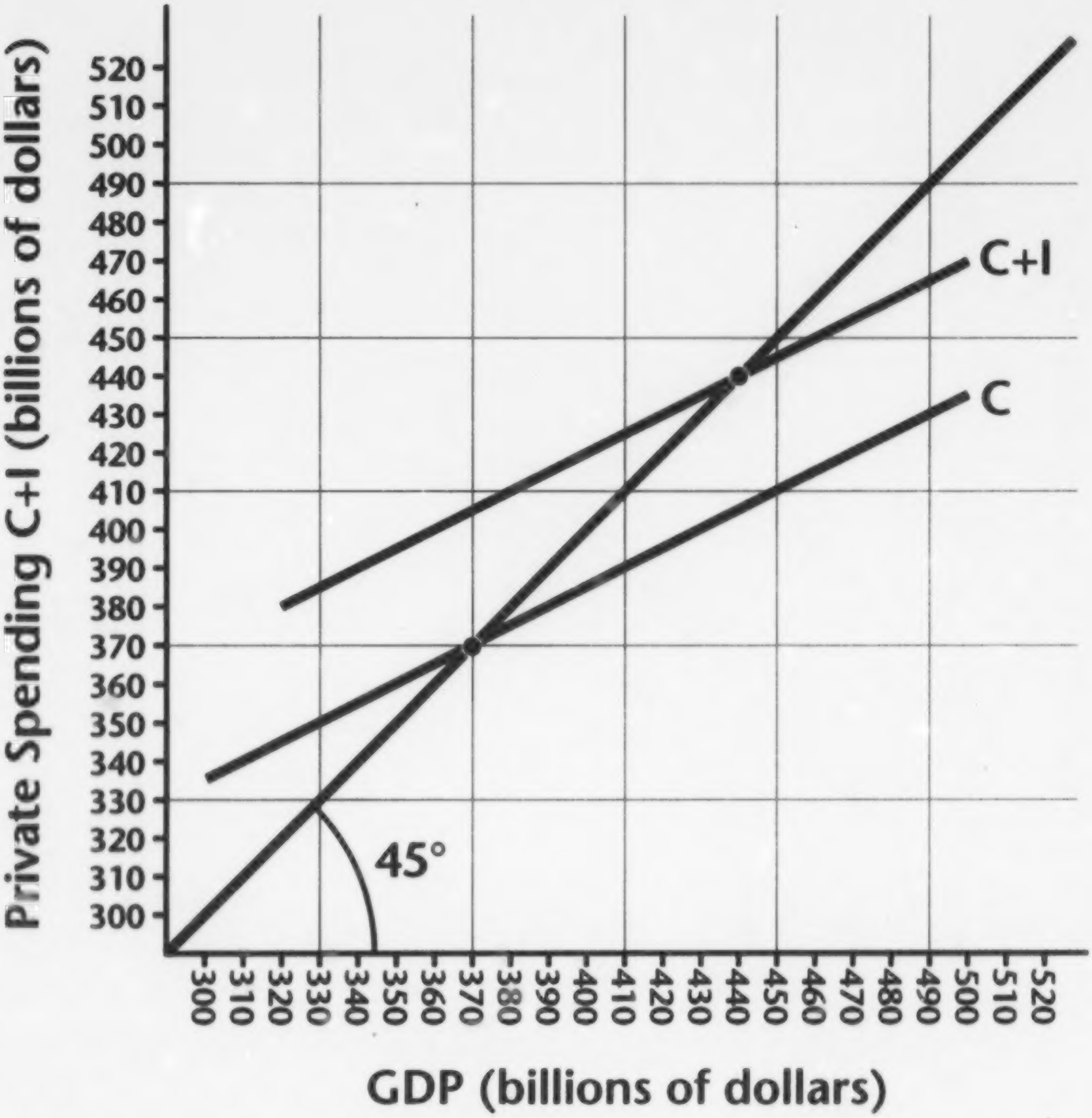
Visual 3.10

The Investment Schedule



1. How much did the equilibrium level of GDP increase with investment of $30 billion?
2. What is the multiplier?

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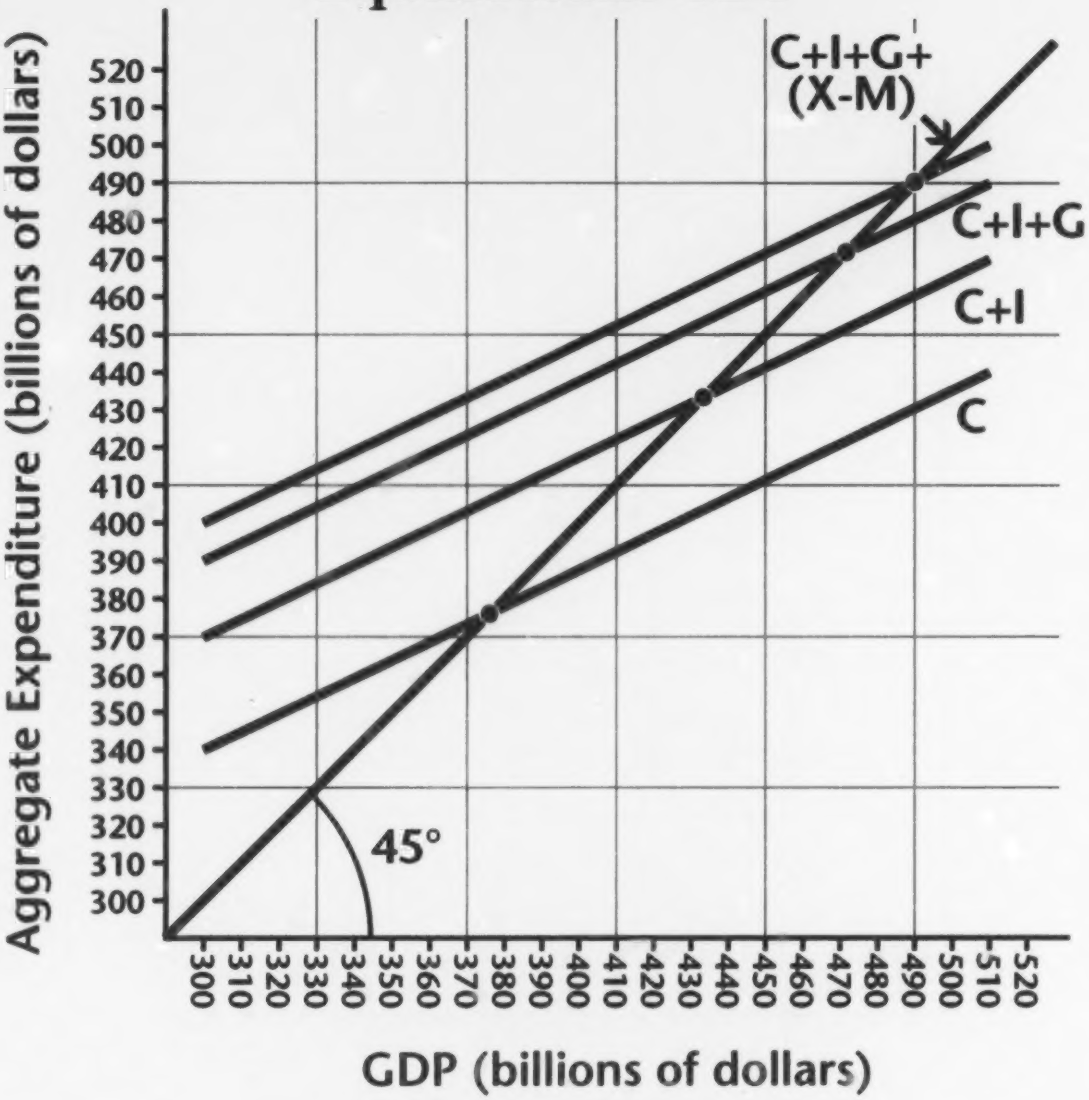
Visual 3.11

Equilibrium GDP



1. What is the level of investment?
2. What is the level of government spending?
3. What is the level of net exports?
4. What is the equilibrium level of GDP?

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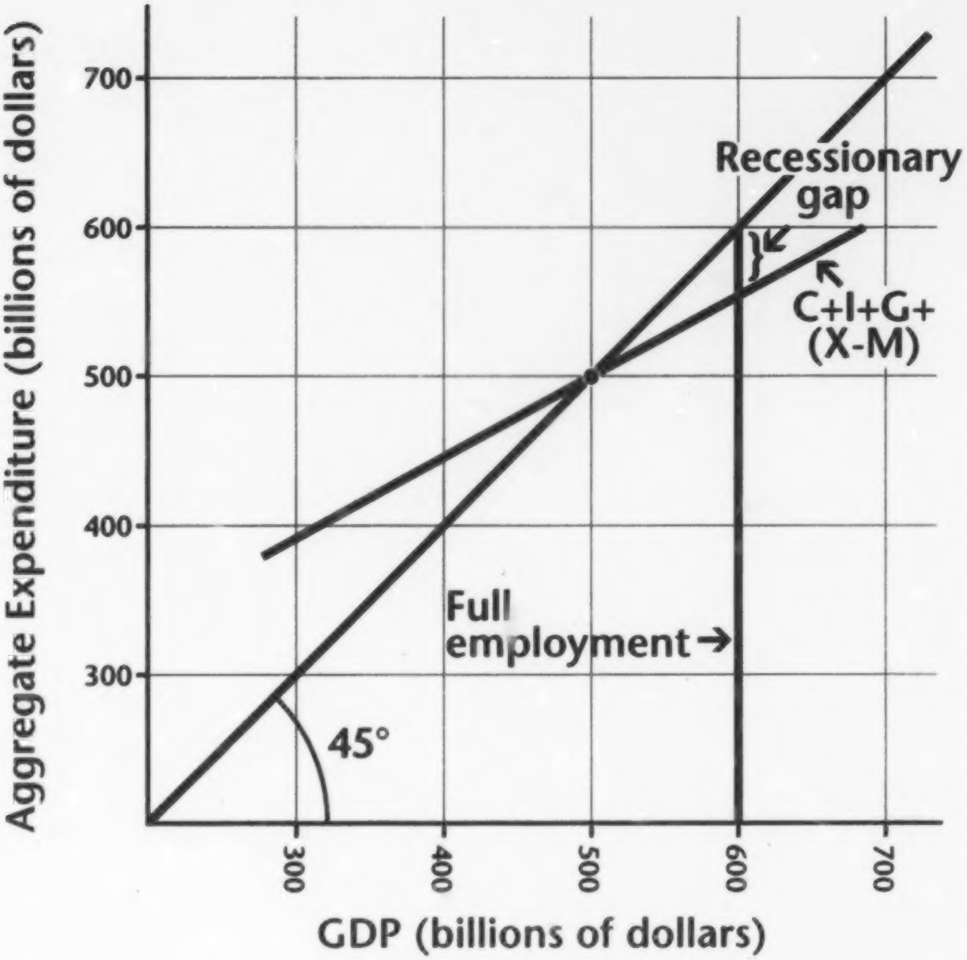
Visual 3.12

A Recessionary Gap



1. What is the equilibrium level of GDP?
2. What is the full-employment level of GDP?
3. What is the size of the recessionary gap?

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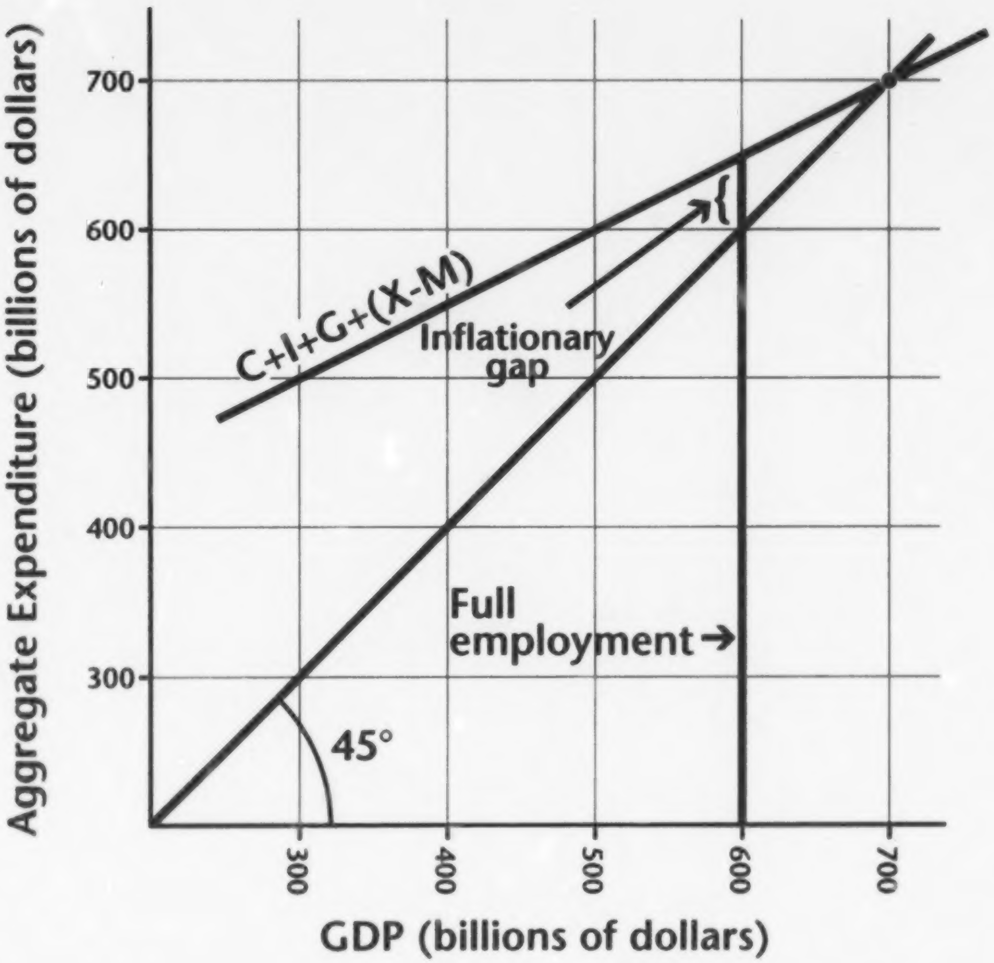
Visual 3.13

An Inflationary Gap



1. What is the equilibrium level of GDP?
2. What is the full-employment level of GDP?
3. What is the size of the inflationary gap?

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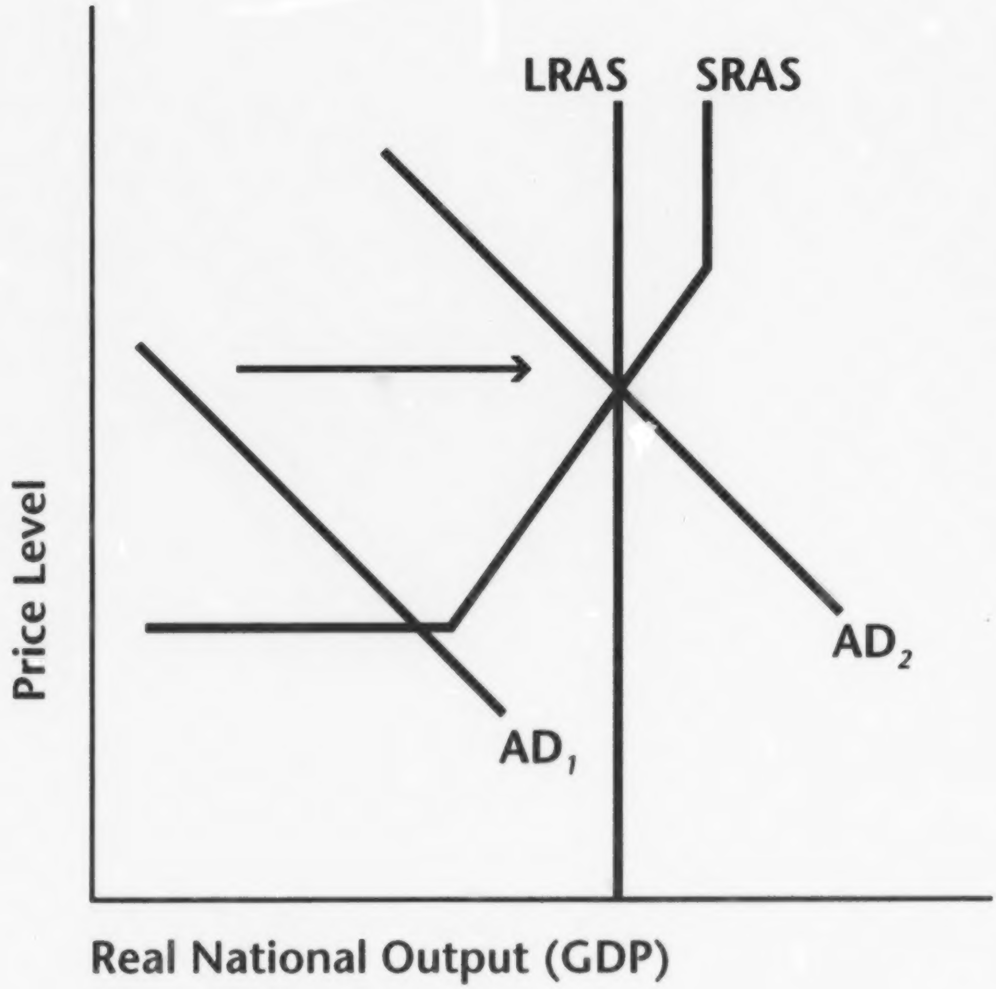
Visual 3.14

Expansionary Fiscal Policy



List and describe three actions the government could take in order to increase aggregate demand from AD$_1$ to AD$_2$.

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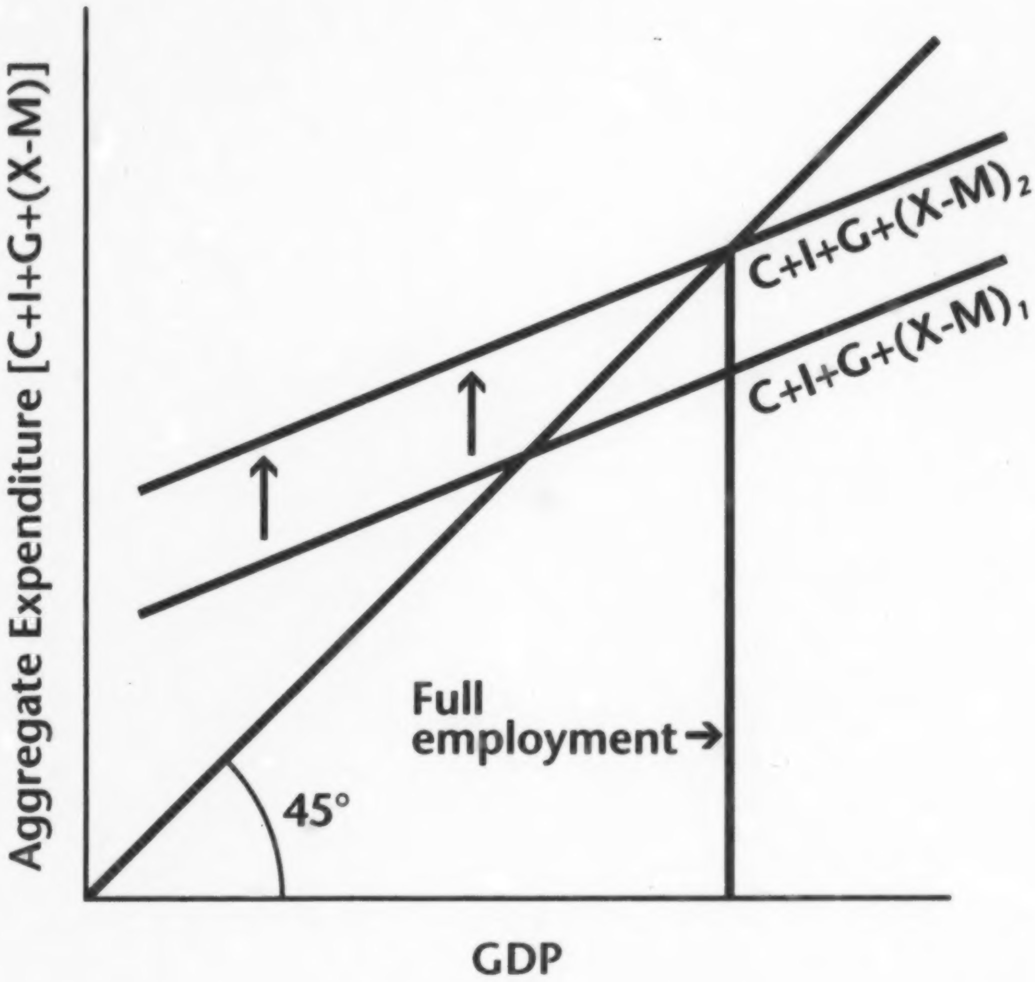
Visual 3.15

Expansionary Fiscal Policy (Keynesian Model)



1. Why would decreasing taxes increase C+I+G+(X–M)?
2. Why would increasing government expenditures increase C+I+G+(X–M)?

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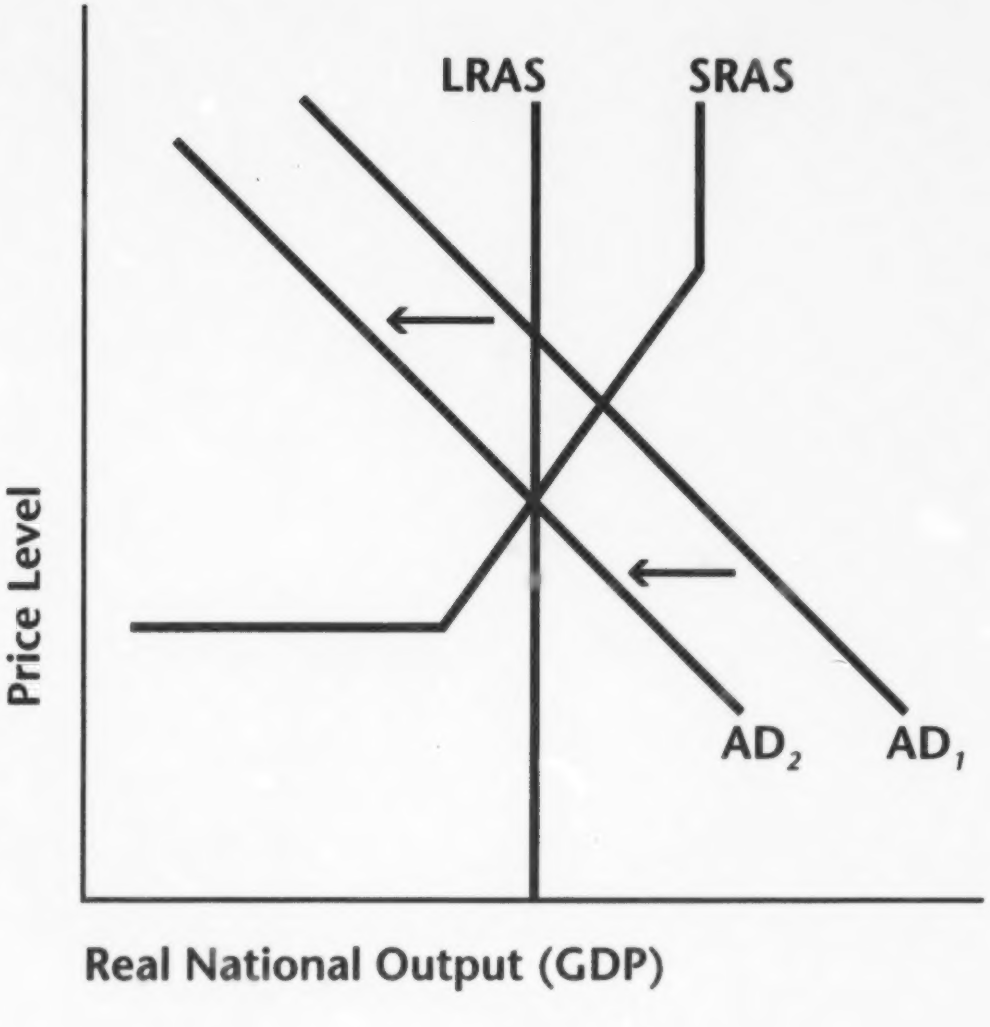
Visual 3.16

Contractionary Fiscal Policy



List and describe three actions the government could take in order to decrease aggregate demand from AD$_1$ to AD$_2$.

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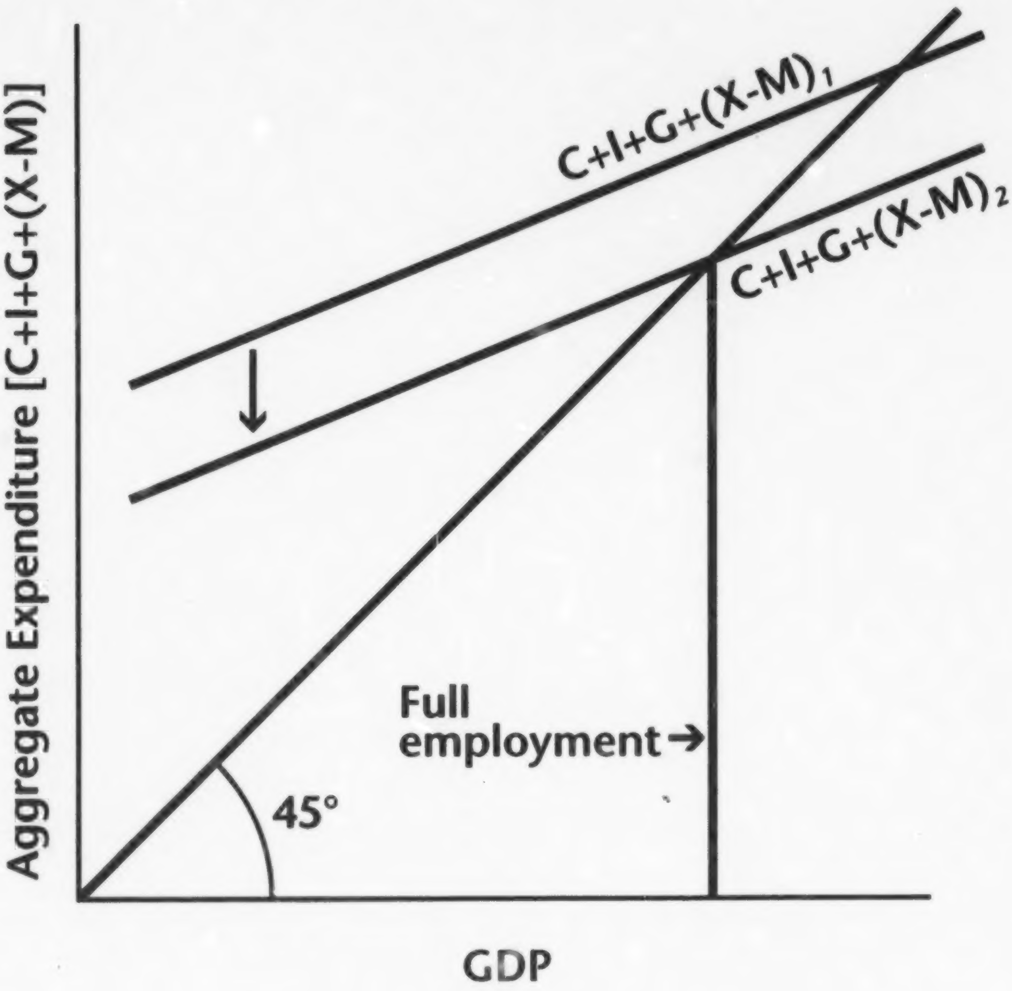
Visual 3.17

Contractionary Fiscal Policy (Keynesian Model)



1. Why would increasing taxes decrease C+I+G+(X–M)?
2. Why would decreasing government expenditures decrease C+I+G+(X–M)?

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Macroeconomics

Unit 4

Money, Monetary Policy, and Economic Stability

13 Days

Unit Overview

In this unit, students learn how monetary policy affects aggregate demand and the condition of the economy. The concepts include the definition of money, fractional reserve banking, and the Federal Reserve System. Students should learn how multiple deposit expansion affects the money supply and how the money supply affects the economy. The unit ends with an understanding of the goals and tools of monetary policy and compares the Keynesian view of monetary policy with the monetarist view. The College Board indicates that 15 to 20 percent of the macroeconomics exam will cover these topics.

Textbook Assignments

Baumol and Blinder, Chapters 29, 30, 31

McConnell and Brue, Chapters 13, 14, 15

Miller, Chapters 14, 15, 16

Planning Ahead

In Unit 4, money, banking, and monetary policy are added to the analytical framework developed in Unit 3. Unit 5 will provide practice in analyzing economic policies using the skills and information learned in Units 3 and 4.

Lesson 1 defines money and discusses its functions. Lesson 2 introduces the classical equation of exchange and develops the understanding of how money is expanded through bank loans. Lesson 3 covers the Federal Reserve System and monetary policy. Finally, Lesson 4 provides practice in graphing the effects of monetary policy on output, employment, and the price level, using both AD/AS curves and Keynesian expenditure curves. Lesson 4 also compares and contrasts Keynesian monetary policy and monetarist monetary policy. Students will return to that topic in Unit 5.

Unit 4 Activities

Activity 34 Money Is What Money Does
Activity 35 What's All This About the M's?
Activity 36 The Monetary Equation of Exchange
Activity 37 The Multiple Expansion of Demand Deposits
Activity 38 Reserve Requirements and the Multiplier
Activity 39 The Federal Reserve System and Monetary Policy
Activity 40 Monetary Policy
Activity 41 Graphing Keynesian Monetary Policy
Activity 42 Monetarist Monetary Policy

Visuals

Visual 4.1 The Functions of Money
Visual 4.2 The Monetary Equation of Exchange
Visual 4.3 How Money Is Created
Visual 4.4 How the Fed Controls the Money Supply
Visual 4.5 Expansionary Monetary Policy: "Easy Money"
Visual 4.6 Contractionary Monetary Policy: "Tight Money"
Visual 4.7 Monetary Policy: The Monetarists' View

Sample Unit 4 Plan

Week 1	**Week 2**	**Week 3**
☐ 1. Use Visual 4.1 to discuss the functions and characteristics of money. 2. Use Activity 34 in small groups. Discuss answers. 3. Assign: Baumol, Chap. 29; McConnell, Chap. 13; Miller, Chap. 14.	☐ 1. Give a lecture on the organization, structure, and functions of the Fed. 2. Use Visual 4.4 to explain monetary policy tools.	☐ 1. Use Visual 4.7 to discuss monetarist ideas. 2. Have students complete Activity 42. 3. Discuss the answers to Activity 42. 4. Discuss the Fed's dilemma in monetary policy.
☐ 1. Have students read Activity 35 and answer the questions. 2. Discuss answers to Activity 35. 3. Assign: McConnell, Chap. 14; Miller, Chap. 15.	☐ 1. Have students complete Activity 39. 2. Discuss the answers to Activity 39. 3. Introduce Activity 40.	☐ Review, using Sample Multiple-Choice and Essay Questions.
☐ 1. Use Visual 4.2 to give a lecture on the equation of exchange. 2. Do hot potato activity. 3. Have students complete Activity 36.	☐ 1. Complete Activity 40 in groups. 2. Discuss the answers to Activity 40. 3. Assign Baumol, Chap. 31.	☐ Unit Test.
☐ 1. Discuss the answers to Activity 36. 2. Use Visual 4.3 to discuss multiple bank credit expansion. 3. Have students complete Activity 37. 4. Discuss the answers to Activity 37.	☐ 1. Use Visual 4.5 to explain Keynesian expansionary monetary policy. 2. Use Visual 4.6 to explain Keynesian contractionary monetary policy. 3. Have students complete Parts B and C of Activity 41.	☐
☐ 1. Have students complete Activity 38. 2. Discuss the answers to Activity 38. 3. Assign: Baumol, Chap. 30; McConnell, Chap. 15; Miller, Chap. 16.	☐ 1. Have students complete Activity 41 in groups. 2. Have students graph answers on the board and discuss the answers.	☐

UNIT 4, LESSON 1

Money: What It Is and What It Does

Introduction and Description

This lesson describes the functions of money and items used as money over the years. The lesson also describes the current measures of money in the United States and tells why we need more than one measure of money.

Objectives

1. Define and explain the *functions of money*.
2. Describe the characteristics that are needed to enable money to carry out these functions effectively.
3. Define, compare, and contrast the various definitions of the money supply (M1, M2, M3).

Time Required

- Two class periods

Materials

1. Activities 34 and 35
2. Visual 4.1

Procedure

1. Use Visual 4.1 to discuss the functions of money: medium of exchange, standard of value, store of value.
2. Discuss the characteristics of money that help make it effective in accomplishing these functions: portability, uniformity, acceptability, durability, divisibility, stability in value.
3. Explain that money is what money does.
4. Have the students read Activity 34.
5. Now divide the class into seven groups. Have each group evaluate how well one of the seven items listed in Activity 34 performs the functions of money.
6. Have each group report to the class. Ask the class to add to the discussion.
7. Now discuss the types of money and give examples of each type: commodity money (gold, silver), representative money (old U.S. Notes), fiat money (U.S. currency and coin), checkbook money.
8. Have the students complete Activity 35; discuss the answers.

ACTIVITY 34 **ANSWER KEY**

Money Is What Money Does

1. **Salt**

   Portable but messy; uniform; acceptability depends on society; somewhat durable; divisible into grains; may be too plentiful to be stable.

2. **Large stone wheels**

   Difficult to carry; could be uniform; acceptable but might be counterfeited; durable; not divisible; would be stable in value only if the number of wheels is controlled.

3. **Cattle**

   Not portable; not uniform; not durable—they die; not divisible.

4. **Gold**

   Serves most functions well but is heavy for big purchases.

5. **Copper coins**

   Serve most functions well but may not be limited, and large amounts are not portable.

6. **Pieces of paper printed by a government**

   Serve functions well unless the government prints too many of them.

7. **A personal check**

   Serves most functions well, but acceptability can be a problem if one does not trust the check writer.

ACTIVITY 35 **ANSWER KEY**
What's All This About the M's?

1. The size of the money supply affects the economic well-being of the country. If there is too little money, there could be a recession. If there is too much, there could be inflation.
2. A medium of exchange, a standard of value, and a store of value.
3. Currency, coin, and checkable deposits.
4. A savings account or money market mutual fund.
5. While these accounts serve as a store of value, they can easily be changed into a liquid form of money used to buy things.
6. The growth of money affects inflation, unemployment, interest rates, and the output of goods and services.
7. Price stability, full employment, and economic growth.
8. Credit cards are actually short-term loans. Credit card bills are not directly subtracted from checking accounts. Rather, the credit cardholder pays the bill from a checking account. Not only should loans *not* be counted as money, but if they were, and the check to pay the bill were also counted, one economic transaction would be double-counted in the money supply. ATM or debit cards that withdraw the amount directly from checking accounts are money. Using an ATM card is like using a check.
9. The United States financial system is vast and complex with trillions of transactions.
10. a. M1 = 444 + 168 = 612.

    b. M2 = 612 + 1,614 + 302 = 2,528

    c. M3 = 2,528 + 635 = 3,163.

UNIT 4, LESSON 2

Money: Its Effects on the Economy and How It Is Created

Introduction and Description

This lesson begins by familiarizing students with the classical equation of exchange and the role of money in determining the level of output and the price level. (Some textbooks cover this idea early in the unit while others cover it later.)

With this background, students learn how banks expand the money supply by lending out excess reserves. Because this process is so important when analyzing monetary policy, we have provided a lot of practice in calculating reserve requirements, required reserves, excess reserves, demand deposits, and money multipliers. It is dog work, but practice should help students see the multiple expansion of reserve requirements at work.

Objectives

1. Write, explain, and analyze the equation of exchange (MV = PQ).
2. When provided financial data, compute a financial institution's required and excess reserves.
3. Define and compare *required reserves* and *excess reserves.*
4. Describe what happens to the money supply when a financial institution makes a loan.
5. Describe what happens to the money supply when a loan is repaid.
6. When given the reserve requirement, calculate the money multiplier.
7. When given the reserve requirement and level of excess reserves, calculate potential money growth.
8. List, explain, and analyze leakages that reduce the money-creating potential of the banking system.

Time Required

- Three class periods

Materials

1. Activities 36, 37, and 38
2. Visuals 4.2 and 4.3

Procedure

1. Using Visual 4.2, give a lecture on the equation of exchange.
2. Students seem to have problems with the concept of velocity of money. Gary Gables of Pepperdine University suggests the analogy of a "hot potato" as a useful way to illustrate the concepts of velocity and money demand.*
   - The velocity with which you pass the potato to the next person is a function of its holding cost, i.e., the hotter the potato, the faster you pass it on and the more round trips it makes per period. Similarly, the velocity with which you pass money (exchanging money for the next person's goods) is related to the opportunity cost of holding money (the forgone interest rate); i.e., higher interest rates yield velocity so that more transactions and nominal national income can be generated with a given amount of money.
   - The game is over when the temperature of the potato falls enough that someone is willing to hold it. Similarly, equilibrium is reached in the money market when people are willing to hold the amount of money in existence because they consider the marginal benefits of holding it to be equal to the opportunity costs.
   - If people were allowed to wear thin gloves to shield them from some of the heat, the velocity with which the potato was passed around would fall. Similarly, introducing interest-earning forms of money shields its holders against some opportunity costs of holding money and tends to reduce velocity, other things equal.
3. Have the students complete Activity 36. This Activity familiarizes them with the classical equation of exchange and the role of M and V in determining the level of nominal output (PQ). After completing the Activity, the students should be able to

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*From Ralph Byrns and Gerald Stone, *Great Ideas for Teaching Economics*, Fifth Edition (New York: HarperCollins, 1992), p. 214.

LESSON 2 continued

define the terms M, V, P, and Q and understand the basic relationships among them. The equation of exchange is also essential to the monetarist theory of money.

4. Discuss the answers to Activity 36.
5. Use Visual 4.3 to discuss multiple bank credit expansion. Be sure to explain such terms as *required reserves, excess reserves, demand deposits,* and *time deposits*. Explain why bank lending creates money and why repaying loans destroys money. Explain how the reserve requirement limits the banking system's ability to create money.
6. Have the students complete Activity 37.
7. Discuss the answers to Activity 37. Here are some things to watch out for in your discussion.
   a. This Activity needs to be buttressed with some additional explanation of the assumptions in the first paragraph. Unless your text is quite explicit on this point, it will not be clear to your students why or how Bank 1's loan ends up as a new deposit in Bank 2, etc. You may wish to employ some T-accounts to show, by example, how this can occur. Once they understand the process, students can also appreciate that assumption 2 is a strong assumption, which makes the exposition of the "steps" in the MEDD simpler but which is not strictly necessary to the process.
   b. Many students may be unprepared to make the required transition from individual banks to the banking system as a whole when completing the table for "All Other Banks Combined." The easiest way to get the correct figure for the "New Deposits" blank for "All Other Banks Combined" may be simply to add the new deposits for the first seven banks ($5,217.03) and subtract them from the $10,000 figure given as the "Total for All Banks" to get $4,782.97. A second, preferred, way is to multiply the $478.30 excess reserves loaned out by Bank 7 by ten to get a (rounded) figure of $4,783.00. This step in the Activity, thus, presents you with a good opportunity to stress the difference between an individual bank, which can lend out only the amount of its excess reserves (due to adverse clearing balances) and the banking system as a whole.
   c. Many students will calculate the expansion ratio to be 9. They need to realize that they are incorrectly comparing "Excess Reserves Loaned Out" of $9,000 with the initial deposit of $1,000. The correct comparison is the total in new deposits of $10,000 with the initial deposit of $1,000.
8. Be sure the students now understand how to calculate the money multiplier and potential money growth.
9. Have the students complete Activity 38; discuss the answers.

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ACTIVITY 36 **ANSWER KEY**
The Monetary Equation of Exchange

Part A.
The equation of exchange (MV = PQ) was the basis of classical macroeconomic analysis and is an important element in the present-day monetarist approach to macroeconomic thinking.

1. The equation of exchange has four parts, which are defined as follows (complete the following definitions by writing one or two sentences about each):

M = **Stock of money, M1. Currency in circulation, traveler's checks, and checkable deposits.**

V = **Income (GDP) velocity of circulation. The average number of times a dollar is spent on final goods and services per time period (usually one year).** $V = \frac{GDP}{M} = \frac{PQ}{M}$

P = **The average price level of the final goods and services in GDP. The GDP deflator.**

Q = **Real output. The quantity of goods and services in GDP. Real GDP in dollars of the base year of the GDP deflator.**

Classical economists assumed that the velocity of money was stable (constant) over time because it was determined largely by institutional factors, for example, how often people are paid. Velocity would be higher if everyone were paid $50 eight times a month than if they were paid $200 twice a month. Make sure this concept, frequency of payment influencing velocity, is constant with your definition of velocity (V) above.

2. The product of velocity (V) and the money supply (M) equals PQ, which can be defined as: **Nominal GDP and current output (Q) at current prices (P).**

3. Suppose velocity remains constant, while the money supply increases. Explain how this could affect GDP (PQ). **GDP (PQ) would increase. If there is full employment, P would increase. If there is unemployment, Q could increase.**

4. During the 1970s, two major changes that took place in the financial world were the increased use of credit cards and the increased use of computers by banks and financial institutions. Explain how these changes might be expected to affect velocity. **V would increase. A given stock of M could "work harder" and finance more transactions more quickly.**

5. As the result of major legislation and regulatory reform in the early 1980s, banks and other financial institutions began paying interest on a significant proportion of the checkable deposits included in the M1 definition of the money supply. Explain how this change might be expected to affect velocity of M1. **V would decrease. People would be more willing to hold (not spend) M if it paid interest.**

ACTIVITY 36 ANSWER KEY continued

6. What might one infer from the changes of the 1970s and 1980s about the classical assumption that institutional factors tend to keep velocity constant?
V will *not* remain constant if institutional factors change.

Part B.

The table *The U.S. Economy, 1979–1992,* gives data on the U.S. economy for 14 recent years. Due to rounding, some totals may not come out exactly.

1. Complete the table by filling in the five blanks.

The U.S. Economy, 1979–1992

Year	M1 (Billions of $) Dec. Figures	V	P Implicit Price Deflator for GDP (1987 = 1.0000)	Q (Real GDP)	PQ (Nominal GDP)
1979	**382.8**	6.3966	.6449	3796.8	2448.6
1980	408.8	**6.6257**	.7171	3776.3	2708.6
1981	436.4	6.9445	**.7886**	3843.1	3030.6
1982	474.6	6.6363	.8376	**3,760.3**	3149.6
1983	521.2	6.5330	.8716	3906.6	**3,405.0**
1984	552.4	6.8378	.9105	4148.5	3777.2
1985	620.1	6.5130	.9437	4279.8	4038.7
1986	724.5	5.8918	.9691	4404.5	4268.6
1987	750.0	6.0532	1.0000	4539.9	4539.9
1988	787.1	6.2259	1.0385	4718.6	4900.4
1989	794.6	6.6081	1.0853	4838.0	5250.8
1990	827.2	6.6758	1.1322	4877.5	5522.2
1991	899.3	6.3132	1.1777	4821.0	5677.5
1992	1026.6	5.7965	1.2089	4922.6	5950.7

After you have completed this table, answer the remaining questions.

2. Between 1979 and 1980, velocity was increasing. During this same period, real output (Q, the quantity of goods and services produced) actually decreased. What explanation can you provide for this? (*Hint:* What happened to the price level?)
P increased over 11 percent from .6449 to .7171.

$$\begin{array}{r} .7171 \\ -\underline{.6449} \\ .0722 \end{array} \qquad \frac{.0722}{.6449} = 11.196\%$$

3. Between 1982 and 1983, velocity was decreasing, but during this same period both the price level (P) and real output (Q) were increasing. What explanation can you provide for this? (*Hint:* What happened to the stock of money?)
M increased over 9.8 percent from 474.6 to 521.2.

$$\begin{array}{r} 521.2 \\ -\underline{474.6} \\ 46.6 \end{array} \qquad \frac{46.6}{474.6} = 9.819\%$$

ACTIVITY 37 **ANSWER KEY**

The Multiple Expansion of Demand Deposits

This Activity is designed to illustrate how banks lending out excess reserves can expand the nation's money supply. Assume that (1) all banks keep a fractional reserve of ten percent of deposits and lend out 90 percent of deposits from their excess reserves (reserves over ten percent of deposits) and (2) all money lent out by one bank is redeposited in another bank.

1. Under these assumptions, if a new deposit of $1,000.00 is made in Bank 1:
   a. How much will the bank keep in reserve? $ **100**
   b. How much will Bank 1 lend out as excess reserves? $ **900**
   c. How much will be redeposited in Bank 2? $ **900**
   d. How much will Bank 2 keep in reserve? $ **90**
   e. How much will Bank 2 lend out? $ **810**
   f. How much will be redeposited in Bank 3? $ **810**

2. Use your answers to question 1 to help you complete the table *Deposits, Reserves, and Loans in Seven Banks*. Fill in all the blanks in the table, rounding numbers to the second decimal (e.g., $59.049 = $59.05 and $53.144 = $53.14). After you have completed the table, answer the questions that follow by filling in the blanks or crossing out the incorrect words in parentheses so that each statement is a true statement.

Deposits, Reserves, and Loans in Seven Banks

Bank No.	New Deposits	10% Fractional Reserves	Loans
1	$1,000.00	$100.00	$900.00
2	900.00	**90**	810.00
3	**810**	81.00	**729**
4	**729**	**72.90**	656.10
5	**656.10**	**65.61**	**590.49**
6	**590.49**	59.05	**531.44**
7	531.44	**53.14**	478.30
All Other Banks Combined	**4,782.97**	**478.30**	**4,304.67**
Total for All Banks	10,000.00	**1,000**	9,000.00

3. In this example:
   a. The original deposit of $1,000 increased total bank reserves by $ **1,000** . Eventually this led to an expansion of bank deposits to a total of $10,000, $ **1,000** of which was due to the original deposit and $ **9,000** of which was due to bank lending activities.

ACTIVITY 37 ANSWER KEY continued

b. This total-to original deposit expansion ratio of **10** to one was based on a fractional reserve of ten percent, a lending out of all excess reserves by all banks, and a redeposit of all loans to the banking system.

c. Therefore, if the fractional reserve had been 15 percent instead of ten percent, the amount of deposit expansion would have been *(~~more~~/less)* than in this example.

d. If the fractional reserve had been five percent instead of ten percent, the amount of deposit expansion would have been *(more/~~less~~)* than in this example.

e. If banks had not lent out all their excess reserves, the amount of deposit expansion would have been *(~~more~~/less)* than in this example.

f. If all loans had not been redeposited in the banking system, the amount of deposit expansion would have been *(~~more~~/less)* than in this example.

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ACTIVITY 38 **ANSWER KEY**
Reserve Requirements and the Multiplier

Complete the following calculations illustrating reserve requirements.

1. If $1,000 is deposited in the bank, calculate how much the bank must hold in reserve for each of the following reserve requirements. How much is the *required reserve*?

a. **$10** 1%
b. **$50** 5%
c. **$100** 10%
d. **$125** 12.5%
e. **$150** 15%
f. **$250** 25%

2. If $1,000 is deposited in the bank, calculate how much the bank can loan out for each of the following reserve requirements. How much is the *excess reserve*?

a. **$990** 1%
b. **$950** 5%
c. **$900** 10%
d. **$875** 12.5%
e. **$850** 15%
f. **$750** 25%

3. Fill in the blanks on the balance sheet. Carry decimals out to two digits when appropriate.

Bank Balance Sheet

Account Holder	New Deposits	Required Reserves	Excess Reserves
Eric	$1,000.00	**$100.00**	$900.00
Juan	$900.00	$90.00	**$810.00**
LaTandra	$810.00	**$81.00**	**$729.00**
Angie	**$729.00**	$72.90	**$656.10**
Huang Suk	**$656.10**	**$65.61**	$590.49

4. Calculate the money multiplier for each of the following reserve requirements.

a. **100** 1%
b. **20** 5%
c. **10** 10%
d. **8** 12.5%
e. **6.67** 15%
f. **4** 25%

5. A bank receives a new deposit of $1,000. Calculate the total amount of money that can be created for each of the following reserve requirements.

a. **$100,000** 1%
b. **$20,000** 5%
c. **$10,000** 10%
d. **$8,000** 12.5%
e. **$6,667** 15%
f. **$4,000** 25%

ACTIVITY 38 ANSWER KEY continued

6. Why don't we want an infinite growth of the money supply? (*Hint:* remember the equation of exchange, MV = PQ.)
   If velocity is stable, the real GDP would be infinite. Because we know resources are scarce, Q cannot be infinite. Therefore, an infinite money multiplier would cause hyperinflation.

7. If the Federal Reserve wants to increase the money supply, should it raise or lower the reserve requirement? Why?
   Lower the reserve requirement. Banks would be able to make more loans, and the multiplier would increase.

8. If the Federal Reserve increases the reserve requirement and velocity remains stable, what will happen to nominal GDP? Why?
   Nominal GDP will fall because the money supply fell.

9. What economic goal might the Federal Reserve try to meet by reducing the money supply?
   Reducing inflation.

UNIT 4, LESSON 3

The Federal Reserve System and Monetary Policy

Introduction and Description

In this lesson, students learn about the functions of the Federal Reserve System and the ways the Fed affects real GDP, employment, and the price level. Students can then add monetary policy tools to fiscal policy and gain further understanding of how the economy can or cannot be controlled.

Activity 39 provides some straightforward information on the functions and structure of the Federal Reserve System. A lot of educational materials are available from the Federal Reserve Banks if more detail is needed. Activity 39 is also a fairly easy introduction to monetary policy.

Activity 40, however, provides students with a detailed analysis of the three main tools used by the Fed to control the money supply. It requires that students have previous knowledge of reserve requirements, the money multiplier, and the use of T-accounts either from class discussion or the textbook.

Objectives

1. Describe the structure and functions of the Federal Reserve System.
2. Define and explain *open market operations*.
3. Define and explain *discount window operations* and the *federal funds market*.
4. Define and explain the purpose of *reserve requirements*.
5. Explain how open market operations, the discount rate, and the reserve requirement are used to expand or contract the money supply.
6. Evaluate the effectiveness of the three main tools of monetary policy.
7. Recognize the impact of each monetary policy tool on the level of demand deposits in the banking system.
8. Differentiate between the impact of the controls on a single bank and on the banking system as a whole.
9. Calculate the reserve requirement and/or the dollar volume of required reserves.
10. Determine the value of excess reserves or reserve deficiencies.
11. Recognize the impact of the inclusion of currency on the money multiplier.

Time Required

- Three class periods

Materials

1. Activities 39 and 40
2. Visual 4.4

Procedure

1. Give a lecture on the organization, structure, and functions of the Federal Reserve System.
2. Use Visual 4.4 to discuss the three major tools used by the Fed to apply monetary policy: raise or lower the reserve requirement, raise or lower the discount rate, buy or sell securities in open market operations.
3. Have the students complete Activity 39; discuss the answers.
4. Now introduce Activity 40. It would be a good idea to have the students complete this in groups during class time. Allow one period to introduce the Activity and have students work on it. Allow another period to discuss the answers. Before the students begin the Activity, go over the simplified balance sheets used in questions 5 and 6. Students who have had or are currently taking accounting sometimes find the simplifications confusing while those without an accounting background may find the method exceptionally complex.
5. Have the students complete the Activity in groups. Because the Activity is long and requires many calculations, the main points may become lost. To avoid this, visit each

LESSON 3 continued

group and keep stressing the ultimate goal of each policy change.

6. Discuss the answers. The background information that follows each questions can be used to help explain the answers.

ACTIVITY 39 **ANSWER KEY**
The Federal Reserve System and Monetary Policy

1. Describe the organization of the Federal Reserve System.
   The Federal Reserve System consists of a seven-member Board of Governors in Washington, DC, and 12 regional banks.

2. What is monetary policy?
   Deliberate action by the Federal Reserve to affect the expansion or contraction of the money supply in order to maintain the trend of economic growth, employment, and prices at desired levels.

3. What happens to interest rates if the Fed follows a contractionary, or tight, monetary policy? **They rise.**

4. What happens to interest rates if the Fed follows an expansionary, or easy, monetary policy? **They fall.**

5. What is the federal funds rate?
   The interest rate a financial institution must pay if it needs to borrow money to meet its reserve requirement (the balance it is required to keep at its regional Federal Reserve Bank).

6. Why do observers pay close attention to the federal funds rate?
   It is a signal of changes in monetary policy.

7. Circle the correct symbol (↑ for increase, ↓ for decrease). What would happen to the money supply and to interest rates if the Fed:
   a. Sold government securities on the open market.
      Money supply ↑ [✓ ↓]
      Interest rates [✓ ↑] ↓
   b. Bought government securities on the open market.
      Money supply [✓ ↑] ↓
      Interest rates ↑ [✓ ↓]
   c. Raised the reserve requirement.
      Money supply ↑ [✓ ↓]
      Interest rates [✓ ↑] ↓
   d. Lowered the reserve requirement.
      Money supply [✓ ↑] ↓
      Interest rates ↑ [✓ ↓]
   e. Raised the discount rate.
      Money supply ↑ [✓ ↓]
      Interest rates [✓ ↑] ↓
   f. Lowered the discount rate.
      Money supply [✓ ↑] ↓
      Interest rates ↑ [✓ ↓]

ACTIVITY 39 ANSWER KEY continued

8. In the table *Tools of Monetary Policy* indicate how the Federal Reserve would use each of the three monetary policy tools to pursue an expansionary policy and a contractionary policy.

Tools of Monetary Policy

Monetary tool	Expansionary policy	Contractionary policy
Open market operations	**Buy government securities**	**Sell government securities**
Discount rate	**Lower**	**Raise**
Reserve requirements	**Lower**	**Raise**

9. a. What kind of monetary policy would the Fed probably follow if the country had an annual inflation rate of 15 percent?
A contractionary policy.
b. Why?
Inflation results from too rapid an increase in the supply of money or too rapid an increase in aggregate demand or both.

10. a. What kind of monetary policy would the Fed probably follow if the country were in a severe recession with high unemployment and falling prices?
An expansionary policy.
b. Why?
A lack of growth in the money supply helps prolong or aggravate a recession. An expansionary monetary policy would usually act to lower interest rates, which would stimulate investment in plant and equipment and in inventories and thereby help to curb a recession or help the economy to climb out of a recession.

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ACTIVITY 40 **ANSWER KEY**

Monetary Policy

This Activity deals with the three main tools used by the Federal Reserve Board to influence bank lending activities and control the checking deposit component of the nation's money supply:

- reserve requirements
- open market operations
- discount rates.

Fill in the answer blanks or cross out the incorrect words in parentheses.

Reserve Requirements

Questions 1–4 deal with the effects of changes in the reserve requirement on both an individual bank (q.1 and q.2) and on the banking system (q.3 and q.4). They make use of two basic equations:

RR = rr x DD where RR = dollar value of required reserves
rr = reserve requirement
DD = demand deposits
Excess reserves = total reserves - RR

1. If commercial banks collectively have $80 billion in reserves, and the reserve requirement on checking deposits is ten percent, what is the maximum amount of checking deposit liabilities they can have? $ **800** billion.

   $RR = rr \times DD;\ 80 = .10\,(DD);\ \frac{80}{.10} = DD;\ 800 = DD$

2. A bank with checking deposit liabilities of $4,000,000 is fully loaned, with zero excess reserves, when the reserve requirement is 20 percent.

   Let RR_1 = required reserves initially (rr = 20%)
   = .2 ($4,000,000) = $800,000

   a. If the reserve requirement is lowered to 15 percent, the bank's excess reserves would rise to $ **200,000** .

   RR_2 = required reserves when rr = .15
   = .15 ($4,000,000) = $600,000
   Excess reserves = $RR_1 - RR_2$ = $800,000 – $600,000 = $200,000

   b. If the reserve requirement is raised to 25 percent, the bank would have a reserve deficiency of $ **200,000** .

   RR_3 = required reserves when rr = .25
   = .25 ($4,000,000) = $1,000,000
   Reserve deficiency = $RR_3 - RR_1$ = $1,000,000 – $800,000 = $200,000

3. Assume that all banks collectively have $800 billion in checking deposits, $120 billion in reserves, and that they are fully loaned up with zero excess reserves.

   a. This means that the reserve requirement is **15** percent.

   Use: $RR_1 = rr \times DD;\ \$120 = rr\,(\$800);\ \frac{120}{800} = rr;\ .15 = 15\%$

b. If the Federal Reserve lowers the reserve requirement on checking deposits by five percent, the new reserve requirement will be **10** percent, and all of the banks collectively will have excess reserves in the amount of $ **40** billion. If the banks decide to return to a position of zero excess reserves, they will be able to *(expand/~~reduce~~)* their loans and investments by $ **+400** billion until their checking deposit liabilities have changed to a new total of $ **1,200** billion.

New reserve requirement = 15% – 5% = 10%
$RR_2 = .1 \times \$800 = \$80$; excess reserves = $RR_1 - RR_2 = \$120 - \$80 = \$40$
Banks will expand until (using RR = rr x DD)
$\$120 = .1 \times DD$; $\frac{\$120}{.1} = DD$; $\$1200 = DD$

4. Assume that all banks collectively have $800 billion in checking deposits, $120 billion in reserves, and that they are fully loaned up with zero excess reserves.

a. This means that the reserve requirement is **15** percent.

$RR_1 = rr \times DD$; $\$120 = rr \times \$800$; $\frac{120}{800} = .15$

b. If the Federal Reserve raises the reserve requirement on checking deposits by five percent, the new reserve requirement will be **20** percent, and all of the banks collectively will be deficient in reserves in the amount of $ **–40** billion. In order to meet the new reserve requirement and return to a position of zero excess reserves, the banks will have to *(~~expand~~/reduce)* their loans and investments by $ **–200** billion until their checking deposit liabilities have changed to a new total of $ **600** billion.

New reserve requirement = 15% + 5% = 20%
$RR_2 = .2 \times \$800 = \$160$; reserve deficiency = $RR_2 - RR_1 = \$160 - \$120 = \$40$
Banks will reduce their liabilities until:
$RR_1 = rr \times DD$; $\$120 = .2 \times DD$; $\frac{\$120}{.2} = DD$; $\$600 = DD$

Open Market Operations

5. Suppose that the Federal Reserve authorities decide to buy $10 million of U.S. government securities from the American public. The Federal Reserve pays for these bonds by issuing checks which the public deposits in their checking deposit accounts at commercial banks.

a. On *Balance Sheet A*, show how this transaction (after the checks are cleared) affects the balance sheets of the Federal Reserve Banks, the commercial banks combined, and the public. (Show only the changes in the balance sheets; be sure to indicate the minus or plus sign in front of the change, – for decrease and + for increase.).

The Fed buys $10 million of government securities from the public. To see the first-round effects of this on the balance sheets of the Fed, combined commercial banks, and the public, start with the public. The public gives up $10 million in securities (therefore, under "Government Securities," enter –10) and receives as payment a demand deposit drawn on the Fed itself. (Public's holding of demand

ACTIVITY 40 ANSWER KEY continued

deposits becomes +10.) The public deposits the $10 million into their accounts at commercial banks. Thus, the liabilities side of the commercial banks is increased by $10 million (demand deposits +10). The banks send the demand deposits to the Fed for collection. The Fed credits the commercial banks with $10 million in reserves. Thus, on the assets side, commercial banks' reserves increase by $10 million. The Fed's balance sheet then shows on the liabilities side a $10 million increase in member bank reserves, which is balanced by the $10 million increase in government securities that the Fed purchased from the public.

Balance Sheet A

Federal Reserve Banks

Assets	Liabilities
Government Securities	Member Bank Reserves
$ **+10** million	$ **+10** million

Combined Commercial Banks

Assets	Liabilities
Reserves	Checking Deposits
$ **+10** million	$ **+10** million

Public

Assets	Liabilities
Government Securities	
$ **–10** million	
Checking Deposits	
$ **+10** million	

b. As a direct result of the Fed's purchase of government securities, the money supply of the country has *(increased/~~decreased~~)* by $ **10** million.

c. Suppose that before the Fed's purchase, the commercial banks had no excess reserves. If the reserve requirement on checking deposits is ten percent, this means that the commercial banks now have excess reserves of $ **9** million, and the maximum money multiplier is **10** .

The $10 million increase in banks' reserves is composed of both required reserves and excess reserves. The change in the level of required reserves is:
RR = rr (DD); 10% ($10 million) = $1 million.

The commercial banking sector thus has excess reserves of:

Excess reserves = total reserves – RR
= $10,000,000 – $1,000,000 = $9,000,000.

These excess reserves can be used to cover new deposits totaling:

$$\$9{,}000{,}000 = .1\ (DD);\ \frac{\$9{,}000{,}000}{.1} = DD;\ \$90{,}000{,}000 = DD.$$

d. Suppose that the commercial banks decide to reduce the excess reserves in the preceding question to zero by making loans to the public. This would result in additional changes in the balance sheets of the combined commercial banks and the public. On *Balance Sheet B*, show the *additional changes* in the balance sheets; be sure to indicate the minus or plus sign in front of the change, – for decrease and + for increase.

The commercial banks would increase their loans to the public by $90 million on the assets side. These monetized loans would increase the demand deposit liabilities of the commercial banks by $90 million. The demand deposits created in the monetizing process appear as assets on the public's balance sheets. The public's demand deposit assets increase by $90 million. The loans stand as liabilities to the public and represent a $90 million increase in their loan liabilities.

Balance Sheet B

Combined Commercial Banks

Assets	Liabilities
Loans to Public	Checking Deposits
$ **+90** million	$ **+90** million

Public

Assets	Liabilities
Checking Deposits	Loans from Banks
$ **+90** million	$ **+90** million

e. The total effect of the Fed's open market purchase on the money supply is to cause it to *(rise/~~fall~~)* by $ **100** million.

The total effect on the money supply is an increase of $100 million ($10 million from the first-round impact and $90 million from the loans created in 5d).

6. Suppose that the Federal Reserve authorities decide to sell $10 million of U.S. government securities to the American public. The public pays for these bonds by issuing checks drawn on their checking deposit accounts at commercial banks.

a. On *Balance Sheet C*, show how this transaction (after the checks are cleared) affects the balance sheets of the Federal Reserve banks, the commercial banks combined, and the public. (Show only the *changes* in the balance sheets; be sure to indicate the minus or plus sign in front of the change, – for decrease and + for increase.)

The Fed sells $10 million of U.S. government securities. To see the first-round impact, focus initially on the public's balance sheet. The public acquires $10 million worth of securities, which it pays for by drawing on its demand deposit accounts. The changes to its balance sheet occur on the assets side: securities increase by $10 million and demand deposits fall by $10 million. This fall in demand deposits is reflected on the liabilities side of the commercial banking sector where the value of demand deposits falls by $10 million. The Fed clears the checks, resulting in a $10 million fall in bank reserves. The Fed's balance sheet registers a $10 million fall in member bank reserve liabilities and a corre-

ACTIVITY 40 ANSWER KEY continued

sponding $10 million fall in its holdings of government security assets due to the sale.

Balance Sheet C

Federal Reserve Banks

Assets	Liabilities
Government Securities $ **-10** million	Member Bank Reserves $ **-10** million

Combined Commercial Banks

Assets	Liabilities
Reserves $ **-10** million	Checking Deposits $ **-10** million

Public

Assets	Liabilities
Government Securities $ **+10** million Checking Deposits $ **-10** million	

b. As a direct result of the Fed's sale of government securities, the money supply of the country has *(~~increased~~/decreased)* by $ **10** million.

c. Suppose that before the Fed's sale, the commercial banks had no excess reserves. If the reserve requirement on checking deposits is ten percent, this means that the commercial banks now have a reserve deficiency of $ **9** million, and the maximum money multiplier is **10** .

The $10 million decrease in bank reserves is coupled with a $10 million decrease in demand deposits. The fall in demand deposits implies a fall in the required level of reserves of:

$$\begin{aligned} RR &= rr\,(DD) \\ &= .1\,(\$10{,}000{,}000) = \$1{,}000{,}000 \end{aligned}$$

Total reserves fell by $10 million so the reserve deficiency is equal to:

$$\$10{,}000{,}000 - \$1{,}000{,}000 = \$9{,}000{,}000$$

These reserves were being used to cover deposits of $90 million. This is found by:

$$\$9{,}000{,}000 = rr\,(DD);\ \$9{,}000{,}000 = .1\,(DD)$$

$$\frac{\$9{,}000{,}000}{.1} = DD$$

d. Suppose that the commercial banks decide to eliminate the reserve deficiency in the preceding question by calling in loans from the public (not renewing loans when they came due). This would result in additional changes in the balance sheets of the combined commercial banks and the public. On *Balance Sheet D*, show only the *additional changes* in the balance sheets; be sure to indicate the minus or plus sign in front of the change, – for decrease and + for increase.

The commercial banks will call in loans until the reserve deficiency is eliminated. This results in a decrease of their loans to the public by $90 million. This action will result in a fall in demand deposit assets held by the public of $90 million and a corresponding $90 million decline in loan liabilities of the public. Combined commercial banks will experience a $90 million decline in demand deposit liabilities and a $90 million decline in loan assets.

Balance Sheet D

Combined Commercial Banks

Assets	Liabilities
Loans to Public	Checking Deposits
$ **–90** million	$ **–90** million

Public

Assets	Liabilities
Checking Deposits	Loans from Banks
$ **–90** million	$ **–90** million

e. The total effect of the Fed's open market sale on the money supply is to cause it to *(~~rise~~/fall)* by $ **100** million.

$100,000,000 = $10,000,000 (initial impact) + $90,000,000 (impact of later rounds).

Discount Rates

7. a. Suppose that the market interest rate on short-term U.S. government securities is nine percent and that the Federal Reserve discount rate is seven percent. It *(would/~~would not~~)* be profitable for member banks to borrow from the Fed (i.e., discount) in order to buy short-term government securities from the public. If the member banks did borrow from the Fed to buy government securities from the public, this would cause the money supply of the country to *(rise/~~fall~~)*.

b. Suppose that the market interest rate on short-term U.S. government securities is nine percent and that the Federal Reserve discount rate is eleven percent. It *(~~would~~/would not)* be profitable for member banks to borrow from the Fed (i.e., discount) in order to buy short-term government securities from the public.

c. Thus, if the Fed keeps the discount rate substantially above market interest rates, this will *(~~encourage~~/discourage)* member banks' requests to borrow from the Fed. On the other hand, if the Fed keeps the discount rate below market interest rates, this will *(encourage/~~discourage~~)* member bank borrowing.

ACTIVITY 40 ANSWER KEY continued

A Final Summary Problem: What Is the Total Money Supply?

8. Assume there is a very small country with a monetary system similar to that of the United States. The money supply of this country is currently $500 thousand, of which $100 thousand is currency and $400 thousand is checking deposits. The reserve requirement is 25 percent and the banks have no excess reserves, so the sum of the required reserves of the commercial banks is $100 thousand.

   a. Suppose Sally Student deposits $1,000 of currency in the banking system. In making this deposit, Student is exchanging money in one form (currency) for money in another form (checking deposits), so this transaction between Student and the banking system directly causes the money supply of the country to *(~~increase~~/remain the same/~~decrease~~)*. The composition of the money supply, however, would change in favor of *(checking deposits/~~currency~~)* at the expense of *(~~checking deposits~~/currency)*; and, in accepting Student's deposit, the banking system has increased both its liabilities (checking deposits) and its assets (reserves) by $ **1,000** .

   b. Since the reserve requirement is 25 percent, $ **250** of the currency which the banking system received from Student should be classified as additional required reserves and $ **750** should be classified as excess reserves.

      To determine required reserves, use the following formula:
      RR = rr (DD); = .25 ($1,000) = $250

      The level of excess reserves:
      Excess reserves = total reserves – RR; $1,000 – $250 = $750

   c. Assuming the banking system takes full advantage of its opportunity to extend new loans to the public, the banking system's loans will increase by $ **3,000** , and its deposits will increase by $ **3,000** .

      The excess reserves can be used to cover new deposits of:
      $750 = rr (DD)
      $750 = .25 (DD)
      $\frac{\$750}{.25} = DD$; $3,000 = DD

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UNIT 4, LESSON 4

How Effective Is Monetary Policy?

Introduction and Description

In this lesson, students explore some of the controversies in implementing monetary policy. Does monetary policy affect output and the price level through interest rates (Keynesian position) or through the equation of exchange (monetarist position)? Should the Fed set money targets or interest-rate targets? How effective has the Fed been in implementing monetary policy? The Activities in this lesson help students think critically about monetary policy, and possibly they will use their knowledge as informed voters.

Activity 41 provides practice for students to understand how Keynesian monetary policy works. On the AP Test, students will be expected to understand how equilibrium in the money market determines interest rates, how the investment demand curve provides the link between changes in the money market and changes in aggregate demand, and how changes in AD affect GDP, employment, and the price level. Activity 41 emphasizes these relationships.

Activity 42 contrasts this viewpoint with the monetarists' viewpoint.

Objectives

1. Graphically illustrate how changes in the money supply affect interest rates, investment, real GDP, employment, and the price level.
2. Compare and contrast the Keynesian and monetarist views of monetary policy.
3. Explain and contrast the effectiveness of controlling interest rates with controlling the monetary base as an effective monetary policy.
4. Given a series of data, identify the economic problem and prescribe the proper monetary policy to correct that problem.

Time Required

- Three class periods

Materials

1. Activities 41 and 42
2. Visuals 4.5, 4.6, and 4.7

Procedure

1. Use Visual 4.5 to discuss expansionary monetary policy. Be sure to cover these points:
   a. The interest rate is determined by the supply of and the demand for money. The Fed influences the supply. The demand is determined by how much money consumers, businesses, and governments want to borrow.
   b. If the Fed increases the supply of money, interest rates decline. This lower rate increases investment, all things equal.
   c. An increase in investment (and spending on consumer durables) increases aggregate demand, which increases real GDP if there is unemployment. If there is full employment, the AS curve is vertical, and only the price level will increase. The increase in AD is illustrated using an AD/AS graph and a Keynesian aggregate expenditure graph.
2. Use Visual 4.6 to illustrate contractionary monetary policy. Be sure to cover these points:
   a. Interest rates will rise.
   b. Investment will decrease.
   c. AD will decrease. If there is an inflationary gap, the decrease in AD will mostly reduce prices. If AD decreases too much, employment could also decrease.
3. Have the students complete Parts A and B of Activity 41.
4. Now discuss basic Keynesian expansionary and contractionary monetary policy to make sure the students get the main points.

LESSON 4 continued

5. In small groups, have the students finish Activity 41 so that they see the relationship between Fed actions and the economic effects of these actions.
6. Have members of different groups graph different answers for Part C of Activity 41 on the board and discuss the answers to Activity 41.
7. Use Visual 4.7 to discuss monetarist ideas on monetary policy. Be sure to emphasize the direct effect that money has on AD. Monetarists believe monetary policy does *not* work through interest rates.
8. Have the students complete Activity 42; discuss the answers.
9. Discuss the Fed's dilemma in monetary policy. The Fed can set money supply targets or interest rates but not both. Ask the students why this is so.

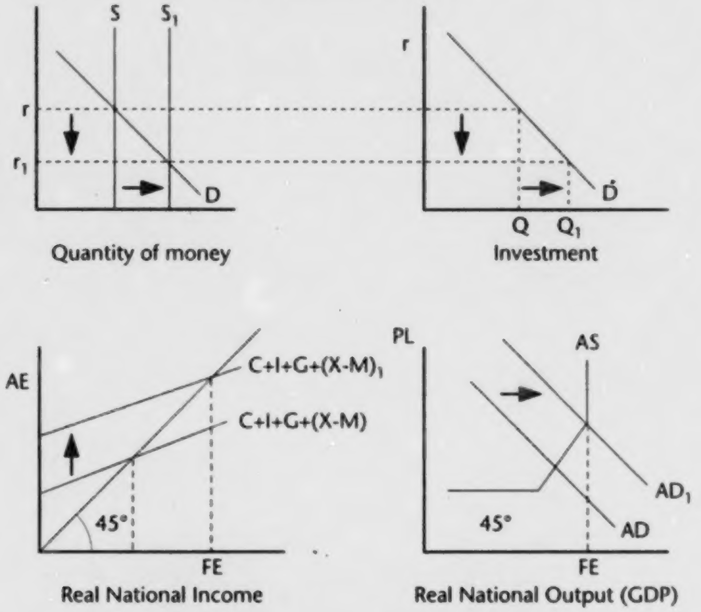
ACTIVITY 41 **ANSWER KEY**
Graphing Keynesian Monetary Policy

Part B. Graphing Expansionary (Easy Money) and Contractionary (Tight Money) Monetary Policies

Expansionary Monetary Policy

An expansionary monetary policy, or easy money policy, is used to help cure a recession. The Fed increases the money supply, which decreases interest rates. The decrease in interest rates increases investment. The increase in investment increases aggregate expenditure (C + I + G + Net Exports) or AD. This increases real GDP. Diagrammatically, an easy money policy looks like the *Easy Money Policy* diagrams.

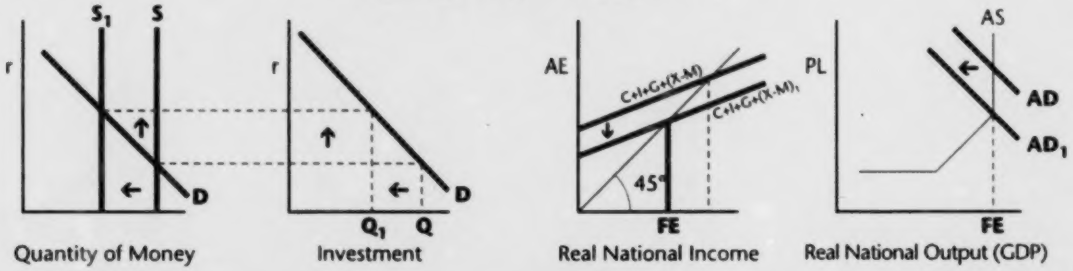
Easy Money Policy


S
S₁
r
r₁
D
Quantity of money
r
D
Q
Q₁
Investment
AE
C+I+G+(X-M)₁
C+I+G+(X-M)
45°
FE
Real National Income
PL
AS
AD₁
AD
45°
FE
Real National Output (GDP)

Contractionary Monetary Policy

A contractionary monetary policy or tight money policy is used to fight inflation. The Fed decreases the money supply to increase interest rates. The increase in interest rates decreases investment. The decrease in investment decreases AE or AD. Draw four graphs to illustrate a tight money policy.

Plotting a Tight Money Policy

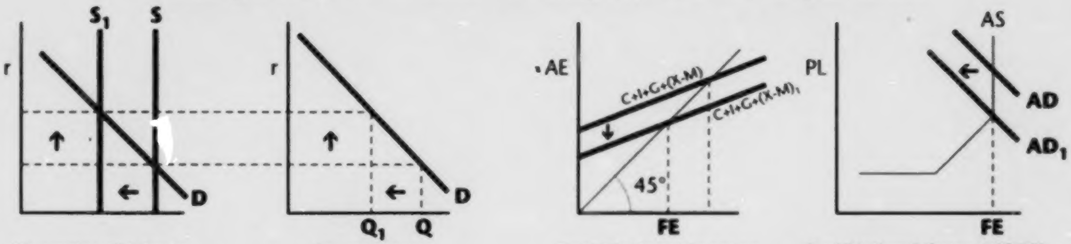

S₁
S
r
D
Quantity of Money
r
D
Q₁
Q
Investment
AE
C+I+G+(X-M)
C+I+G+(X-M)₁
45°
FE
Real National Income
PL
AS
AD
AD₁
FE
Real National Output (GDP)

ACTIVITY 41 ANSWER KEY continued

Part C. Graphing the Effects of Various Monetary Policies
Fill in the answer blanks or cross out the incorrect words in parentheses for the sentences that follow. Then use the graphs provided to illustrate the effects of various monetary policies on aggregate demand, output, and the price level.

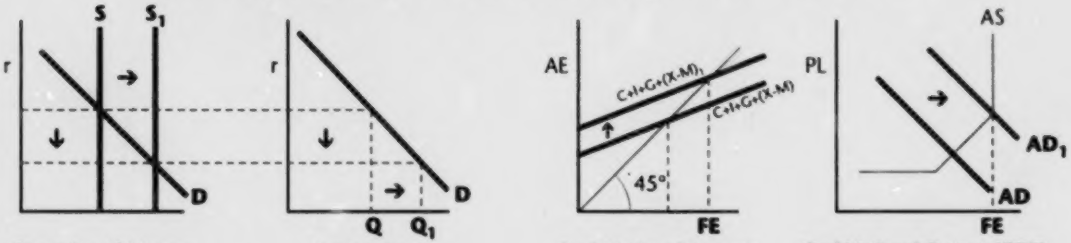
1. The Fed raises the reserve requirement. This policy is designed to *(~~increase~~/decrease)* AD in order to fight *(~~unemployment~~/inflation)*.

Plotting Effects of the Fed's Raising the Reserve Requirement


S₁
S
r
D
Q₁
Q
AE
C+I+G+(X-M)
C+I+G+(X-M)₁
45°
FE
AS
PL
AD
AD₁
Quantity of Money
Investment
Real National Income
Real National Output (GDP)

2. The Fed lowers the discount rate. This policy is designed to **increase** AD in order to fight **unemployment** .

Plotting Effects of the Fed's Lowering the Discount Rate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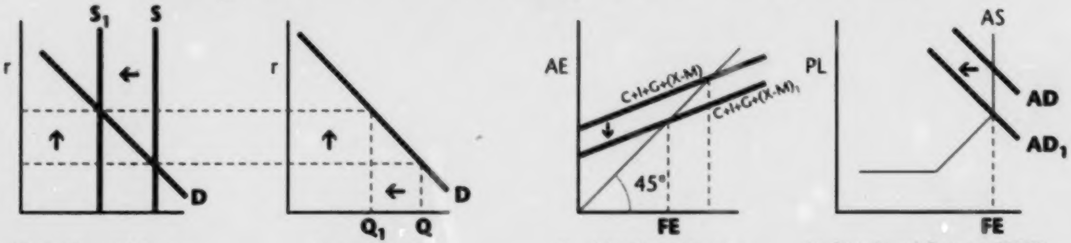
C+I+G+(X-M)
45°
FE
AS
PL
AD₁
AD
Quantity of Money
Investment
Real National Income
Real National Output (GDP)

3. The Fed sells bonds on the open market. This policy is designed to **decrease** AD in order to fight **inflation** .

Plotting Effects of the Fed's Selling Bonds on the Open Market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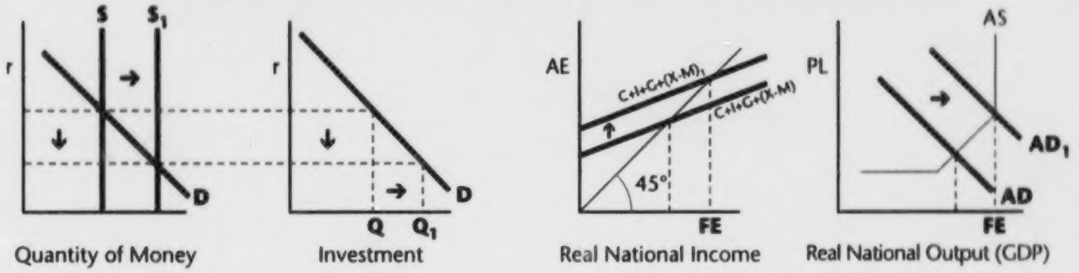
45°
FE
AS
PL
AD
AD₁
Quantity of Money
Investment
Real National Income
Real National Output (GDP)

432

ACTIVITY 41 ANSWER KEY continued

4. The Fed buys bonds on the open market. This policy is designed to **Increase** AD in order to fight **unemployment** .

Plotting Effects of the Fed's Buying Bonds on the Open Market


S
S1
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→
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D
Quantity of Money
r
↓
→
D
Q
Q1
Investment
AE
C+I+G+(X-M)1
C+I+G+(X-M)
↑
45°
FE
Real National Income
AS
PL
→
AD1
AD
FE
Real National Output (GDP)

ACTIVITY 42 **ANSWER KEY**
Monetarist Monetary Policy

Part B. A Monetarist Problem

You must imagine that you are a monetarist and assume that V is stable and equal to 4. The table *Aggregate Supply Schedule (V = 4)* shows the real output, Q, which producers will offer for sale at seven different price levels, P.

Aggregate Supply Schedule (V = 4)

P	Q	PQ	MV	
			M=90	M=175
$1.00	100	$ **100**	$ **360**	$ **700**
$2.00	110	$ **220**	$ **360**	$ **700**
$3.00	120	$ **360**	$ **360**	$ **700**
$4.00	130	$ **520**	$ **360**	$ **700**
$5.00	140	$ **700**	$ **360**	$ **700**
$6.00	150	$ **900**	$ **360**	$ **700**
$7.00	160	$ **1,120**	$ **360**	$ **700**

1. Compute and enter in the table the seven values of PQ.

2. Assume M is $90. Remember, the velocity is stable at 4. Enter the values of MV on each of the seven lines in the table. The equilibrium
   a. Nominal domestic output (PQ or MV) is $ **360** .
   b. Price level is $ **3** .
   c. Real domestic output (Q) is $ **120** .

3. When M increases to $175, MV at each price level is $ **700** , and the equilibrium
   a. Nominal domestic output is $ **700** .
   b. Price level is $ **5** .
   c. Real domestic output is $ **140** .

4. This increase in the money supply increased output by **16.7** percent.

5. This increase in the money supply increased the price level (rate of inflation) by **67** percent.

6. What should the Federal Reserve do if it wants to increase output without significantly increasing the price level?
   Maintain steady growth in the money supply equal to the long-run growth in real GDP.

Answers to Sample Multiple-Choice Questions

1. d
2. c
3. a
4. d
5. e
6. a
7. b
8. a
9. d
10. d
11. d
12. d
13. a
14. a
15. b
16. e
17. c
18. d
19. a
20. c

Answers to Sample Short Essay Questions

1. a: Major points: The bank *may* make loans (or buy securities) based on excess reserves (80 percent of Behroz's deposit); the bank *does* make the loans based on excess reserves; and the deposit created by the loan is redeposited in the banking system (fractional reserves). Answer must go more than one step in loan and redeposit scenario, e.g., show more than $100 of money created!

   b: The possible limitations to the process are (i) the bank willingly holds excess reserves; (ii) customers do not want to borrow; (iii) cash leakages.

The scoring basis for AP question 1 is as follows:

I. *Point Method*
Basically the point distribution is three points for Part a and two for Part b.

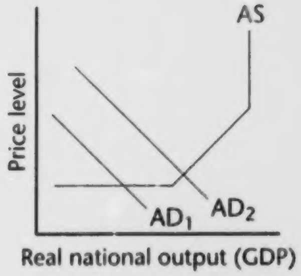
Part a. Points:
one point—loan = deposit minus required reserves;
one point—bank makes loan or buys securities;
one point—loan is redeposited in banking system.

Part b. Points: one point each correct limitation up to two points.

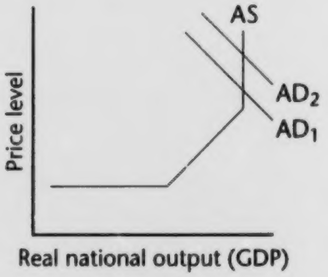
II. *Holistic Method*
The final total should mean something in terms of the overall quality of the answer. Five should reflect an excellent answer but not necessarily perfect; four an excellent answer with a flaw; three a good answer; two an adequate answer; one a seriously deficient answer, but still an answer; zero all else. Therefore, besides counting points, the answer should be looked at as a whole and ultimately judged by its overall quality.

2. *Uncertain.* An increase in the money supply in excess of the ability of GDP to increase will cause inflation. In fact, there will be inflation if the economy is on the intermediate or classical section of the AS curve. However, there will not be inflation if the economy is on the Keynesian section of the AS curve. The greater the level of unemployment, the less the chance of an expansionary monetary policy causing inflation.

3. It is inflationary when the economy is already operating at full employment and real GDP cannot increase quickly enough to match the increase in M1. During a period of full employment, an increase in the money supply will increase AD when AS is vertical. This will only cause the price level to rise.



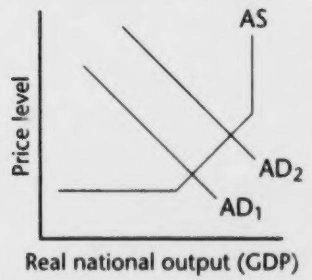
Less than full employment



Full employment

ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

In the intermediate stage of AS, both output and the price level will increase.



It will not be inflationary if the economy is operating in the Keynesian section of the AS curve or if real GDP can rise more quickly than M1 to offset it.

4. The Fed can control the supply of money but not the demand for money. For example, if the demand for money increases, the Fed can increase the money supply to lower rates or keep them unchanged. However, if the Fed decides to set a money supply target, interest rates will vary in response to changes in demand.

5. Keynesians believe monetary policy works through interest rates. Monetarists believe it works through the equation of exchange. The difference can be illustrated like this:

Keynesian

Change in monetary policy → Changes in commercial bank reserves → Change in money supply → Change in interest rates → Change in investment rates → Change in output, employment, etc.

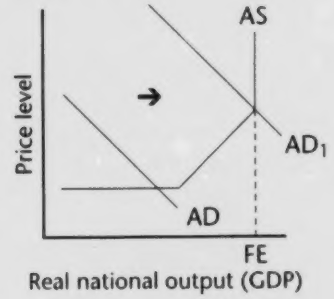
Monetarist

Change in money supply (If *V* is stable) → Change in GDP (However, if *Q* is at *FE*, then *P* must increase.)

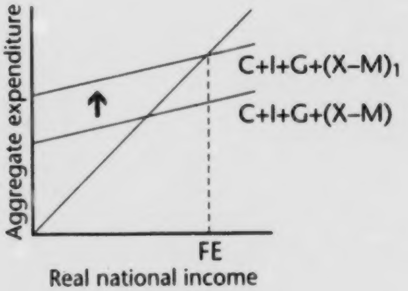
6. To the extent that bankers hold excess reserves, the overall credit expansion potential of the banking system will be reduced. In other words, suppose the reserve requirement is 20 percent and a bank receives new deposits of $500. Further suppose the bank elects to hold 25 percent of the deposits in reserve rather than the required amount. If the bank chose to meet precisely the reserve requirement, it would hold $100 in reserve and lend $400, and since the money multiplier in this case would be 5 (1/.20), the money supply has a potential of being increased by a maximum of $2,000 (5 x $400 in loanable funds). However, should the bank choose to hold 25 percent in reserve, it would hold $125 in reserve and lend only $375. In this case, the money multiplier would be 4 (1/.25), and the money supply would have a potential of being increased by a maximum of $1,500 (4 x $375 in loanable funds). Obviously, a bank's practice of holding excess reserves significantly dampens the expansion of the money supply.

Answers to Sample Long Essay Questions

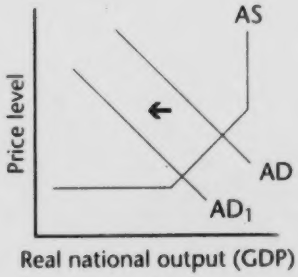
1. a. A recession. Real GDP is down; investment is down; and the unemployment rate is up.
   b. Increase the money supply to increase aggregate demand.
   c. Answers will vary, but the monetary policy must be expansionary. The Fed could decrease the reserve requirement, decrease the discount rate, or buy bonds.
   d. i) Interest rates down.
      ii) Investment up.
      iii) Output up.
      iv) The price level up or steady.
      v) Employment up.
   e. i)

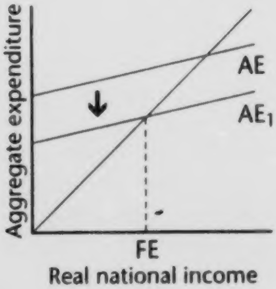

AS
Price level
→
AD$_1$
AD
FE
Real national output (GDP)

ii)


Aggregate expenditure
C+I+G+(X–M)$_1$
↑
C+I+G+(X–M)
FE
Real national income

2. The Fed should follow a contractionary monetary policy by raising the discount rate, raising the reserve requirement, or selling securities on the open market.
   a. Reserves in the banking system will decrease. Because consumers and businesses will compete for the diminished supply of loanable funds, there will be a shortage of funds. This will cause interest rates to rise.
   b. Employment will decrease.
   c. Private investment will decrease because of higher interest rates.
   d. Nominal GDP and real GDP will decrease. An unemployment rate of 6.5 percent is probably less than full employment so the decrease in AD should cause some decrease in real GDP.


AS
Price level
←
AD
AD$_1$
Real national output (GDP)


Aggregate expenditure
AE
↓
AE$_1$
FE
Real national income

Visual 4.1

The Functions of Money

1. **Medium of Exchange**
   Money is accepted by people when they buy or sell goods and services or productive resources.

2. **Standard of Value**
   Money is used like a ruler to compare the value of things people buy and sell.

3. **Store of Value**
   Money is a way to store value from the time people receive it until another time when they spend it.

From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

Visual 4.2

The Monetary Equation of Exchange

$$MV = PQ$$

M = Money Supply

V = Velocity of Money

P = Price Level

Q = Quantity of Goods and Services

From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

500

Visual 4.3

How Money Is Created

The example below assumes a new demand deposit of $1,000 and a reserve requirement of 20 percent.

Banks	Deposits	Required Reserves	Loans
A	$1000	$200	$800
B	$800	$160	$640
C	$640	$128	$512
D	$512	$102.40	$409.60
All other banks together	$2,048	$409.60	$1,638.40
TOTAL	**$5,000**	**$1,000**	**$4,000**

What limits the amount of money the banking system can create?

From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

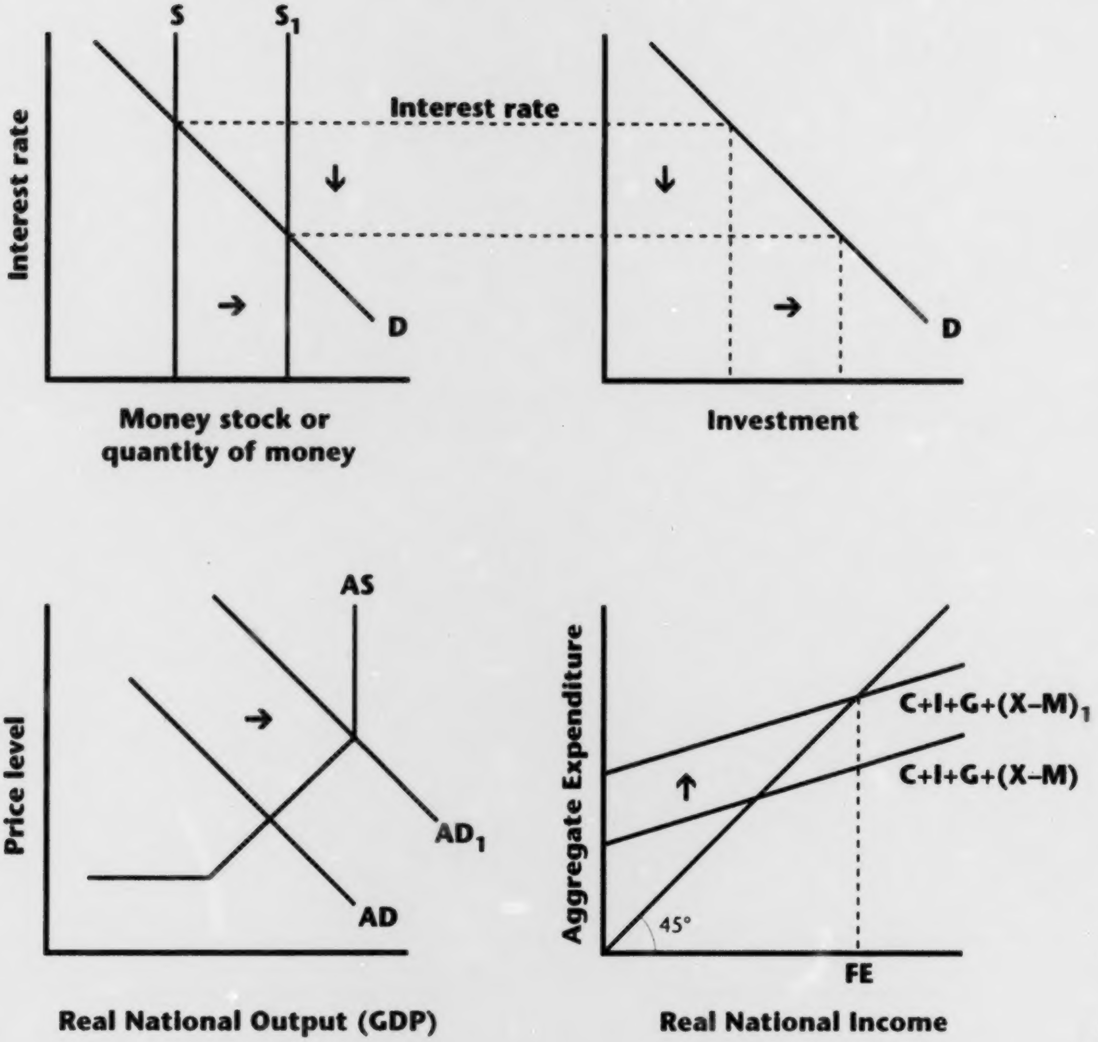
Visual 4.4

How the Fed Controls the Money Supply

Fed Tools	Macroeconomic Effects
Reserve Requirement	
Increase	Contractionary: Money supply ↓ Interest rate ↑ Investment ↓
Decrease	Expansionary: Money supply ↑ Interest rate ↓ Investment ↑
Discount Rate	
Increase	Contractionary: Money supply ↓ Interest rate ↑ Investment ↓
Decrease	Expansionary: Money supply ↑ Interest rate ↓ Investment ↑
Open Market Operations	
Sell securities	Contractionary: Money supply ↓ Interest rate ↑ Investment ↓
Buy securities	Expansionary: Money supply ↑ Interest rate ↓ Investment ↑

Visual 4.5

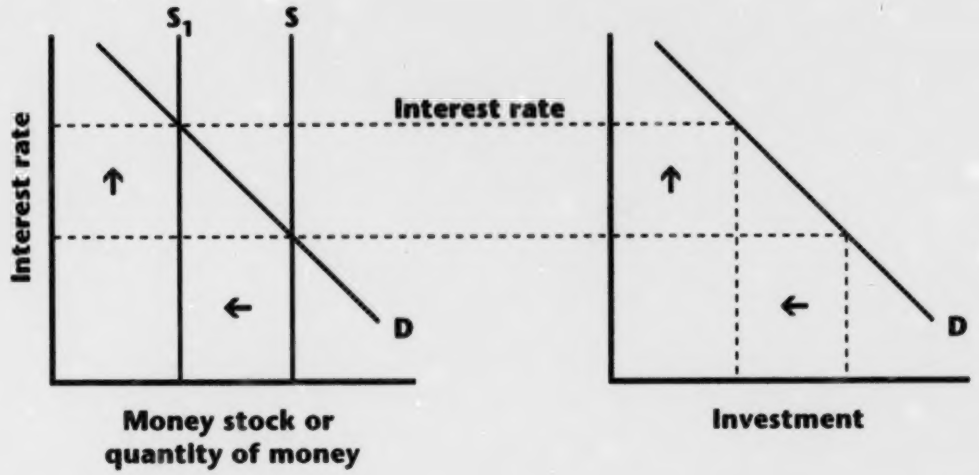
Expansionary Monetary Policy: "Easy Money"

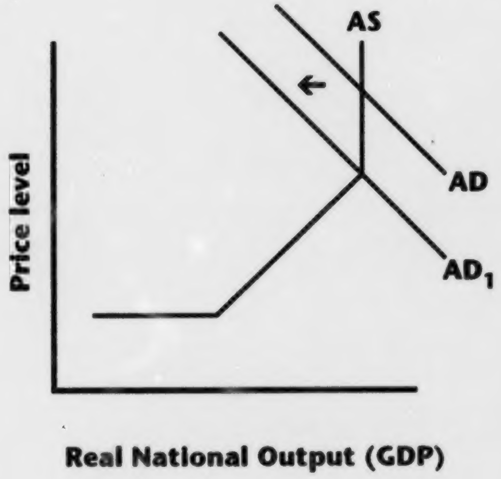

S
S_1
Interest rate
Interest rate
↓
→
D
Money stock or quantity of money
↓
→
D
Investment
AS
→
Price level
AD_1
AD
Real National Output (GDP)
Aggregate Expenditure
$C+I+G+(X-M)_1$
↑
C+I+G+(X–M)
45°
FE
Real National Income

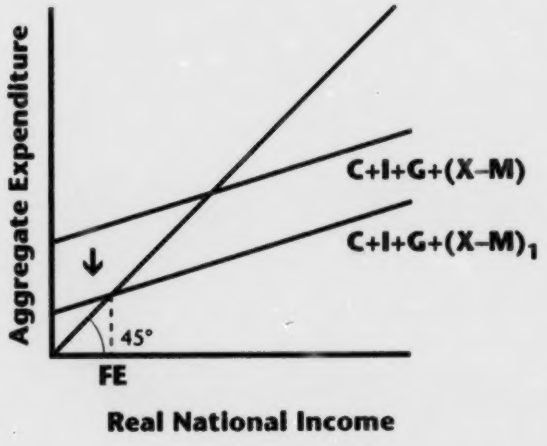
From *Advanced Placement Economics*, © National Council on Economic Education, New York, NY

Visual 4.6

Contractionary Monetary Policy: "Tight Money"







Visual 4.7

Monetary Policy:
The Monetarists' View

1. Changes in the money supply cause direct changes in aggregate demand and thereby changes in nominal GDP.

2. Key is $MV = PQ$.

3. Velocity (V) is stable.

4. Real GDP (Q) can increase 3-5% a year.

5. If Q increases 3-5% a year, any increase in M above 5% merely increases the price level.

6. Increases of less than 3% in M mean Q cannot increase by 3% or that the price level falls.

7. Therefore, strict monetarists would use the monetary rule to advocate that the money supply grow at the rate of growth in real GDP in order to maintain economic stability.

Unit 5

Monetary and Fiscal Combinations: Economic Policy in the Real World

15 Days

Unit Overview

This unit is designed to provide closure to domestic macroeconomic policy. First, students review the basic parts of Units 3 and 4. Then complications are added to the fiscal-monetary policy mix including crowding out and short- and long-run tradeoffs between inflation and unemployment. If the nature of the Phillips curve has not been discussed already, it should be explained now.

This unit also has a lesson on economic growth, although you might have introduced this topic earlier. Understanding the causes of economic growth is very important because our future standard of living depends on economic growth.

In Lesson 3, students analyze case studies on the expansion of the 1960s, the inflation of the 1970s, and the effects of the economic policies of the Reagan, Bush, and Clinton administrations. The lesson ends with a sample essay question. These activities are good practice for AP essay questions on fiscal and monetary policies.

Unlike microeconomic theory, macroeconomic policy reveals deep divisions among economists. In the concluding lesson, students explore reasons that economists disagree and examine the policy prescriptions of the Keynesian, monetarist, and rational expectations theories.

Textbook Assignments

Baumol and Blinder, Chapters 32, 33, 34

McConnell and Brue, Chapters 16, 17, 18, 19

Miller, Chapters 17, 18

Planning Ahead

The heart of this unit is the analysis of interactions of monetary and fiscal policies. The case studies in Lesson 2 are difficult, but a student who masters this material should be in good shape for taking the AP test. Most of the long essay questions at the end of this unit are past AP questions and also provide good practice for the AP exam. The long essay question on the AP exam may also cover the international effects of monetary and fiscal policies. Past AP essay questions that include international implications of monetary and fiscal policies are found at the end of Unit 6.

The disagreements among economists on macroeconomic policy provide an excellent opportunity to examine the reasons that economists disagree and to discuss how hypotheses are empirically tested. This analysis, however, could make students overly cynical and prone to think that one opinion is as good as another. It is important that students understand that economists agree much more than they disagree.

The textbook assignments in this unit should be taken with a sense of humor. Every text covers these topics in different ways so you may have to set up your own organization and force-fit it to your textbook.

Unit 5 Activities

Activity 43	Monetary and Fiscal Policy
Activity 44	Graphing Monetary and Fiscal Policy Interactions
Activity 45	Crowding Out: A Graphical Representation
Activity 46	Economic Growth and the Determinants of Productive Capacity
Activity 47	The Expansion of the 1960s
Activity 48	The Inflation of the 1970s
Activity 49	Supply-Side Economics, Budget Deficits, and Tax Changes
Activity 50	Analyzing Short-Run and Long-Run Effects of Monetary and Fiscal Policies
Activity 51	Why Economists Disagree
Activity 52	Sorting Out Macroeconomic Theories
Activity 53	Graphing Macroeconomic Theories
Activity 54	What Should the President Do?

Visuals

Visual 5.1	The Phillips Curve (Short Run)
Visual 5.2	The Crowding-Out Effect
Visual 5.3	Economic Growth, Long-Run Aggregate Supply, and the Production Possibilities Curve
Visual 5.4	Keynesian Theory
Visual 5.5	Monetarist Theory
Visual 5.6	Rational Expectations Theory
Visual 5.7	Graphing Keynesian Theory
Visual 5.8	Graphing Monetarist Theory
Visual 5.9	Graphing Rational Expectations Theory

Sample Unit 5 Plan

Week 1	**Week 2**	**Week 3**
☐ 1. Use Activity 43 to review Units 3 and 4. 2. Assign: Activity 44; Baumol, parts of Chap. 33; McConnell, parts of Chaps. 17 and 18; Miller, parts of Chap. 17.	☐ Have students complete Activity 48 and discuss the answers.	☐ Use Activity 52 as a cooperative learning lesson.
☐ 1. Go over Activity 44. 2. Give a lecture on the Phillips curve using Visual 5.1. 3. Give a lecture on crowding out using Visual 5.2. 4. Assign Activity 45.	☐ 1. Have students complete Activity 49 and discuss the answers. 2. Assign: Baumol, Chap. 31 and parts of Chap. 33; McConnell, Chap. 16; Miller, Chap. 17.	☐ 1. Use Visuals 5.7, 5.8, and 5.9 to show how macroeconomic theories are illustrated on AS/AD diagrams. 2. Have students complete Activity 53 and discuss the answers. 3. Assign Activity 54.
☐ 1. Discuss the answers to Activity 45. 2. Use Visual 5.3 to discuss economic growth. 3. Have students read Part A of Activity 46 and discuss the main ideas. 4. Assign: Baumol, Chap. 34; McConnell, Chap. 19; Miller, Chap. 18.	☐ 1. Give students 25 minutes to answer Activity 50 to simulate the AP long essay question. 2. Make copies of the answer, distribute them, and discuss the answer.	☐ Have students make presentations on Activity 54.
☐ 1. Have students complete Part B of Activity 46 and discuss the answers. 2. Have students complete Part C of Activity 46 and discuss the answers.	☐ Spend entire class period on Activity 51.	☐ Review for test using Sample Multiple-Choice and Essay Questions.
☐ Have students complete Activity 47 and discuss the answers.	☐ Use Visuals 5.4, 5.5, and 5.6 to discuss macroeconomic theories.	☐ Unit Test.

UNIT 5, LESSON 1

Monetary and Fiscal Policy Interactions

Introduction and Description

This lesson begins with a review of the effects of monetary and fiscal policies on real GDP, employment, and the price level. Students then confront some of the complications that face policy makers including the tradeoffs between inflation and unemployment and crowding out caused by large government deficits. Students also gain additional practice in graphing monetary and fiscal policy changes.

Objectives

1. Identify economic problems and recommend monetary and fiscal policies to improve economic performance.
2. Illustrate with appropriate diagrams the effects of monetary and fiscal policies on real GDP, employment, and the price level.
3. Analyze the tradeoffs involved in various economic policy decisions.
4. Use a Phillips curve to illustrate the tradeoffs between inflation and unemployment in the short run and in the long run.
5. Evaluate the effectiveness of various monetary and fiscal policies.
6. Describe the crowding-out effect.
7. Analyze how crowding out affects economic expansion and the multiplier.

Time Required

- Two and one-half class periods

Materials

1. Activities 43, 44, and 45
2. Visuals 5.1 and 5.2

Procedure

1. Use Activity 43 to review Macroeconomics Units 3 and 4. Activity 43 is simply an organizational tool. Students should reason through the Activity and not try to memorize correct policies for a recession or inflation. Have students give reasons that a particular monetary or fiscal policy would be effective in fighting inflation or stopping a recession. Students should also understand the Keynesian nature (demand management) of Activity 43.
2. After the students answer the questions, have them graph the answers on the board. There will be at least ten graphs, and if both the Keynesian aggregate expenditure model and the AD/AS model are illustrated, there will be 20 graphs.
3. Go over all answers and graphs of Activity 43.
4. Review graphing skills by having the students complete Activity 44; go over the answers.
5. Now examine some of the dilemmas economic policy makers face. Discuss the tradeoffs between inflation and unemployment using the Phillips curve (Visual 5.1). Also distinguish the short-run negatively sloped Phillips curve from the long-run vertical Phillips curve.
6. Now use Visual 5.2 to illustrate the problem of crowding out.
7. Have the students complete Activity 45; go over the answers.

ACTIVITY 43 **ANSWER KEY**
Monetary and Fiscal Policy

Both monetary and fiscal policy can be used to help fight the common economic problems of *inflation* and *recession*. As a class, discuss which policy in each of the pairs below would be more effective in achieving the desired goals. Be prepared to use the AD/AS model to illustrate the outcome of each decision.

Monetary Policy	Fight Inflation	Stop a Recession
1. a. Increase reserve requirements b. Decrease reserve requirements	**a**	**b**
2. a. Buy government securities b. Sell government securities	**b**	**a**
3. a. Lower the discount rate b. Raise the discount rate	**b**	**a**

Fiscal Policy	Fight Inflation	Stop a Recession
4. a. Increase government spending b. Reduce government spending	**b**	**a**
5. a. Raise taxes b. Lower taxes	**a**	**b**

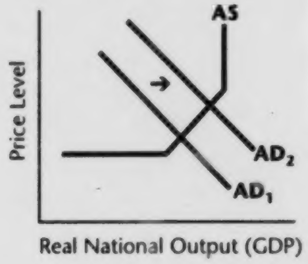
ACTIVITY 44 **ANSWER KEY**
Graphing Monetary and Fiscal Policy Interactions

For each of the following monetary and fiscal policy combinations, draw aggregate demand and supply curves to illustrate the effects of the given policies. Circle the appropriate symbols (↑ for increase, ↓ for decrease, and ? for uncertain) and explain the effect of the policies on:

a. Interest rates.
b. Investment.
c. Real GDP.
d. The price level.
e. Unemployment.

1. The unemployment rate is ten percent, and the CPI is increasing at a two percent rate. The federal government cuts taxes and increases its spending. The Fed buys bonds on the open market.

Effects of Policy A



a. Interest rates ↑ ↓ [✓ ?] Why? **Fiscal policy would increase interest rates; monetary policy would lower them.**

b. Investment [✓ ↑] ↓ ? Why? **Given the unemployment rate, the increased fiscal stimulus would probably cause some increased investment.**

c. Real GDP [✓ ↑] ↓ ? Why? **Because of higher C and G spending.**

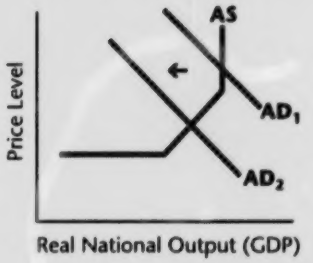
d. The price level [✓ ↑] ↓ ? Why? **AD increase should increase price level.**

e. Unemployment ↑ [✓ ↓] ? Why? **AD increase raises output and employment.**

ACTIVITY 44 ANSWER KEY continued

2. The unemployment rate is six percent, and the CPI is increasing at a nine percent rate. The federal government raises taxes and cuts spending. The Fed raises the reserve requirement and sells bonds on the open market.

Effects of Policy B



a. Interest rates [✓ ↑] ↓ ? Why? **Fed decreased the money supply. Fiscal policy may offset some of the rise in interest rates.**

b. Investment ↑ [✓ ↓] ? Why? **Higher interest rates decrease investment.**

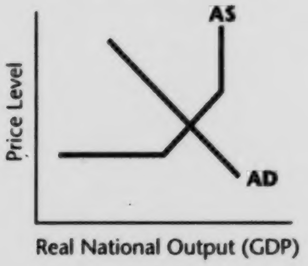
c. Real GDP ↑ [✓ ↓] ? Why? **Decreased AD should lower real GDP somewhat.**

d. The price level ↑ [✓ ↓] ? Why? **Lower AD decreases price level.**

e. Unemployment [✓ ↑] ↓ ? Why? **Lower output decreases employment unless AD stays on vertical portion of AS curve.**

3. The unemployment rate is six percent, and the CPI is increasing at a five percent rate. The federal government cuts taxes and maintains current spending. The Fed raises the discount rate and sells bonds on the open market.

Effects of Policy C



a. Interest rates [✓ ↑] ↓ ? Why? **Greater demand and reduced money supply.**

b. Investment ↑ ↓ [✓ ?] Why? **More demand for investment but higher interest rate.**

c. Real GDP ↑ ↓ [✓ ?] Why? **AD is impossible to predict.**

d. The price level ↑ ↓ [✓ ?] Why? **Conflicting monetary and fiscal policies.**

e. Unemployment ↑ ↓ [✓ ?] Why? **Conflicting monetary and fiscal policies.**

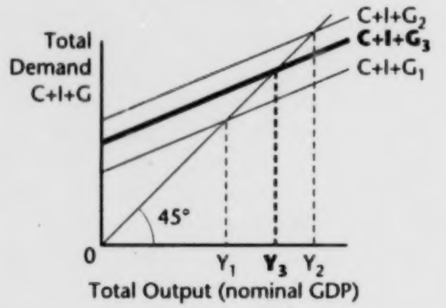
ACTIVITY 45 **ANSWER KEY**
Crowding Out: A Graphical Representation

Monetary policy and fiscal policy do not exist in separate airtight compartments. Monetary policy and fiscal policy can reinforce or accommodate each other, or they can work at cross purposes.

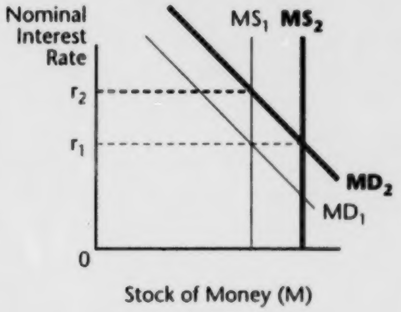
For example, an expansionary fiscal policy will increase aggregate demand. The increase in AD should increase the demand for money. If the Fed does not increase the money supply, interest rates will rise. Because the government is borrowing money to finance its expansionary fiscal policy, consumers and businesses will be crowded out of the financial markets. This could lower consumer and investment spending and slow down the economic expansion. On the other hand, if the Fed increases the money supply, interest rates should not rise as much. Of course, increasing the money supply too much could cause inflation.

1.

Fiscal Policy



Monetary Policy



If fiscal policy increases C+I+G$_1$ to C+I+G$_2$ in the *Fiscal Policy* diagram, and if monetary policy keeps the stock of money at MS$_1$ in the *Monetary Policy* diagram, add one new curve to each diagram to illustrate what many economists call "crowding out" and explain below what happens in each diagram.

a. In the *Monetary Policy* diagram, which curve did you add? What happens as a result of this new curve?
Add the new curve *MD$_2$* (see *Monetary Policy* graph). The increase in *Y* (total output) increases the demand for money which, other things constant, causes interest rates to rise to *r_2*.

b. How does what you describe in the preceding question affect the *Fiscal Policy* diagram? Which curve did you add? What happens as a result of this new curve?
Add the new curve C+*I*+G$_3$ (see *Fiscal Policy* graph). The increase in interest rates crowds out some investment spending, and C+*I*+G$_3$ is lower than C+*I*+G$_2$. *Y$_3$* is lower than *Y$_2$*. (*Y$_3$* is still greater than *Y$_1$* as the increase in interest rates would cause an increase in V, and both sides of C+I+G=M•V would go up some but not as much as they would if M increased.)

ACTIVITY 45 ANSWER KEY continued

c. How could monetary policy prevent what you describe in the preceding question from happening? Add a new curve to the *Monetary Policy* diagram and explain how this would make it unnecessary to change the *Fiscal Policy* diagram. What curve did you add? What happens as a result of this new curve? **Add the new curve MS_2 (see *Monetary Policy* graph). If the money supply is increased to MS_2, interest rates would remain at r_1. If interest rates remain at r_1, there would be no crowding out of investment spending, and the economy would stay at $C+I+G_2$ and Y_2. (The increase in M would permit both sides of C+I+G=M•V to go up more than if there was no increase in M.)**

2. Indicate whether you agree (A), disagree (D), or are uncertain (?) about the truth of the following statements and explain your reasoning.

a. __**?**__ "Exhaustion of excess bank reserves inevitably puts a ceiling on every business boom because without money the boom cannot continue." ***Uncertain* depending on assumptions. The boom could continue to grow if the velocity of circulation increases (i.e., M•V can increase even if M stays constant). Indeed, increased demand for a fixed money stock would tend to increase interest rates, and increased velocity is associated with higher interest rates. Higher interest rates mean that the cost of holding idle cash balances will increase and people will make their cash balances "work harder," i.e., velocity increases. (In terms of a formal portfolio-balancing model, attempts to get more money would lead to the sale of other financial assets, thus lowering their price and increasing their interest yield. But, if you're an income-expenditure advocate, you might argue that the higher interest rates would cut back investment and ultimately slow down the boom, even if there were no absolute ceiling. Inflationary expectations might also be worked in to provide yet another variation of a good answer.)**

b. __**A**__ "A fiscal policy in which the U.S. Treasury Department increased its borrowing by selling a new issue of government bonds would be more expansionary if the new bonds were sold to the Federal Reserve than if they were sold to the general public." ***Agree.* If the new bonds were sold to the Federal Reserve, this would increase the reserves of the banking system as well as the U.S. Treasury Department's checkable deposits. The increase in bank reserves, in turn, could lead to a further expansion of the money supply as the banks lend out the increased reserves. If the new bonds were sold to the general public, however, the increase in the U.S. Treasury Department's checkable deposits would be offset by a decrease in the checkable deposits of the general public, and bank reserves would not change. When the Fed buys newly issued bonds from the Treasury Department, this adds expansionary monetary policy to expansionary fiscal policy. (This process is sometimes called "monetizing the debt.") When the general public buys newly issued bonds from the Treasury**

ACTIVITY 45 ANSWER KEY continued

Department, there is no change in the money supply or bank reserves, and no expansionary monetary policy is added to the expansionary fiscal policy (the debt is not "monetized").

3. If the independent Federal Reserve Open Market Committee wished to accommodate or reinforce a contractionary fiscal policy:

   a. Would it buy or sell bonds? **Sell**

   b. What effect would this have on bond prices and interest rates?
   Bond prices would fall; interest rates would rise.

   c. What effect would this have on bank reserves and the money supply?
   Both bank reserves and the money supply would decrease.

   d. What effect would b and c have on aggregate demand?
   Both higher interest rates and a smaller money supply would tend to reduce aggregate demand.

4. If the independent Federal Reserve Open Market Committee wished to accommodate or reinforce an expansionary fiscal policy:

   a. Would it buy or sell bonds? **Buy**

   b. What effect would this have on bond prices and interest rates?
   Bond prices would rise; interest rates would fall.

   c. What effect would this have on bank reserves and the money supply?
   Both banks reserves and the money supply would increase.

   d. What effect would b and c have on aggregate demand?
   Both lower interest rates, and a larger money supply would tend to increase aggregate demand.

UNIT 5, LESSON 2

Economic Growth

Introduction and Description

It is important for students to understand that their future standard of living depends on economic growth or increases in real GDP or real GDP per capita. Most of the macroeconomics they study concentrates on stabilizing the economy. How can production be increased to capacity? How can unemployment be reduced? How can inflation be reduced?

However, long-term economic health depends on increasing productive capacity, which means increasing long-run aggregate supply. This is much more difficult than changing aggregate demand. The one Activity in this lesson focuses on how economic growth is measured and analyzes the factors that increase or decrease economic growth.

Objectives

1. Describe how economic growth affects a nation's standard of living.
2. Describe how economic growth is measured.
3. List and explain the factors that influence economic growth.
4. Analyze economic policies that increase or decrease economic growth.

Time Required

- One and one-half class periods

Materials

1. Activity 46
2. Visual 5.3

Procedure

1. Introduce the concept that economic growth is important to our standard of living. Ask the students how much better off people are today than they were 50 or 100 years ago. Was life better in the good old days? See Baumol and Blinder, *Economics: Principles and Policy*, Chapter 34, for a comparison of living standards today with those of 100 years ago.
2. Now use Visual 5.3 to illustrate how to measure economic growth. Economic growth can be illustrated by an increase in long-run aggregate supply or a shift outward of the production possibilities curve.
3. Economic growth is measured by the percentage change in real GDP or real GDP per capita. To show how important small increases in economic growth are, introduce the rule of 72. (Some texts refer to this as the rule of 70.) Because of compounding, if you divide 72 by the rate of economic growth, the answer will tell you how long it would take for economic production to double. You could also relate the rule of 72 to savings. For example, a three percent return on savings would double the account in 24 years (72 ÷ 3). On the other hand, a five percent return would double the account in 14 years (72 ÷ 5).
4. Discuss the important factors that contribute to economic growth. The most important factor is growth of productivity (output per unit of input). Increases in real income are dependent upon increases in real output. Increases in real output are dependent on increases in productivity. According to Baumol and Blinder*:

> It is hardly an exaggeration to say that, in the long run, almost nothing counts for the determination of a nation's standard of living but its rate of productivity growth—for only rising productivity can raise standards of living in the long run.
>
> Over long periods of time, small differences in rates of productivity growth compound like interest in a bank account and can make an enormous difference to a society's prosperity. Nothing contributes more to reduction of poverty, to increases in leisure, and to the country's ability to finance education, public health, environmental improvement, and the arts.

How important is productivity growth? Again, look at an example from Baumol and Blinder*:

From William J. Baumol and Alan S. Blinder: *Economics: Principles and Policy*, 6th edition, p.859. Copyright © by Harcourt Brace and Company—The Dryden Press, 1994. All rights reserved.

> **Productivity growth can make an enormous difference in a nation's standing in the hierarchy of the world's economies. It has been remarked that the success of the United States in keeping its annual productivity growth about 1 percent ahead of Great Britain for about a century transformed America from a minor, developing country into a superpower and transformed Great Britain from the world's preeminent power into a second-rate economy.**

5. Therefore, growth in productivity is the key to economic growth. Growth in productivity depends on:
   a. Increases in real investment or capital. To some extent, this depends on low interest rates and higher savings rates.
   b. Improvements in worker skills called human capital.
   c. Technological advancement.
   d. A legal and social environment that rewards achievement and improves economic organization. In other words, the economic system has to provide incentives to work, save, and invest.
6. To reinforce these ideas, have the students read "Part A. Background Information" in Activity 46; discuss the main ideas.
7. Have the students complete "Part B. Measuring Economic Growth"; discuss the answers.
8. Now have the students complete "Part C. Analyzing the Reasons for Economic Growth"; discuss the answers.

ACTIVITY 46 **ANSWER KEY**

Economic Growth and the Determinants of Productive Capacity

Part B. Measuring Economic Growth

1. Suppose the real GDP and the population of an economy in seven different years were those shown in the table *Calculating Per Capita Real GDP.*

Calculating Per Capita Real GDP

Year	Population, in millions	Real GDP, in billions	Per capita real GDP
1	30	$9	$300 **($9,000÷30 = $300)**
2	60	$24	**$400** **($24,000÷60 = $400)**
3	90	$45	**$500**
4	120	$66	**$550**
5	150	$90	**$600**
6	180	$99	**$550**
7	210	$105	**$500**

a. How large would the real per capita GDP of the economy be in each of the other six years? Enter your figures in the table.

b. What was the *amount* of growth in real GDP between year 1 and year 2? **$15 billion**

c. What was the *rate* of growth in real GDP between year 3 and year 4? **46.6 percent**

2. Given the hypothetical data in the table *Calculating Average Rates of Growth*, calculate the average annual rates of growth in real GDP and real per capita GDP over the period given. Be sure to adjust the rate of growth for the number of years in the period so you get average annual rates.

Calculating Average Rates of Growth

Year	Real GDP, in billions	Annual growth, in percent	Real GDP per capita	Annual growth, in percent
1970	$2,416	----	$11,785	----
1975	$2,695	**2.3%**	$12,593	**1.4%**
1980	$3,187	**3.7%**	$13,978	**2.2%**
1985	$3,618	**2.7%**	$15,139	**1.7%**
1988	$3,995	**3.5%**	$16,240	**2.4%**
1991	$4,545	**4.6%**	$17,110	**1.8%**

Real GDP annual growth rate is calculated as follows. For 1970-1975:

$$\$2{,}695 - \$2{,}416 = \frac{\$279}{\$2{,}416} = 11.548\% \div 5 = 2.3\%$$

(This method is an approximation of the actual method used by statisticians to measure economic growth.)

ACTIVITY 46 ANSWER KEY continued

Part C. Analyzing the Reasons for Economic Growth

Economic growth can be illustrated by a rightward move of the long-run aggregate supply curve or a shift outward of the production possibilities curve. Illustrate the effect of each of the following situations using AD and AS graphs. Remember that the policy may also affect short-run AS and AD. Then circle the appropriate symbols (↑ for increase, ↓ for decrease, and — for unchanged) to show the effects of the change on the price level and real GDP. Finally, explain why the policy increased or decreased economic growth.

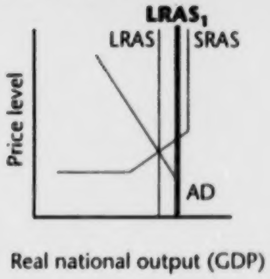
1. Because of improved education, the work force becomes more productive.

   Price level ↑ [✓ ↓] —

   Real GDP [✓ ↑] ↓ —

   Why? **Higher productivity increases the amount of output per unit of input.**

Effect of Improved Education



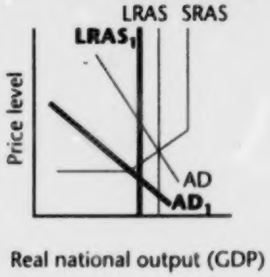
2. The Federal Reserve uses a tight-money policy to increase interest rates.

   Price level ↑ [✓ ↓] —

   Real GDP ↑ [✓ ↓] —

   Why? **Higher interest rates decrease investment which decreases the growth of LRAS. The change in LRAS occurs because of a change in the amount of capital goods. Fewer capital goods would move the curve inward. Aggregate demand would also decrease so the price level would decrease.**

Effect of a Tight-Money Policy



3. Briefly explain how the following policies will affect economic growth and why.
   a. Higher taxes on businesses **Decrease—Fewer incentives to invest.**
   b. Fewer government regulations **Increase—It increases productivity by lowering costs.**
   c. Improvements in technology **Increase—It increases productivity by lowering costs.**
   d. Lower interest rates **Increase—Lower interest rates increase investment.**

ACTIVITY 46 ANSWER KEY continued

e. Less savings by people who want to enjoy the good life **Decrease—There is less saving so there is less left over for investment.**

f. Higher productivity of labor due to improved management styles **Increase—Higher productivity (more output per unit of input).**

UNIT 5, LESSON 3

Case Studies on Monetary and Fiscal Policy Interactions

Introduction and Description

The essay section of the AP Macroeconomics Exam will certainly include questions on monetary and fiscal policies. This lesson consists of three case studies on monetary and fiscal policy interactions. It concludes with an essay question on monetary and fiscal policies. The answer to the question was written by Robert Barry, former chief reader of the AP Economics Test. The long essay questions at the end of this unit, which consist mostly of past AP questions, are also very good practice for the macroeconomic essay questions. The case studies could be done as homework or as in-class assignments in small groups.

Objectives

1. Analyze the effects of various monetary and fiscal policies.
2. Use aggregate demand and aggregate supply diagrams to analyze economic problems and propose solutions to them.
3. Use a Keynesian total expenditure/45° diagram to analyze economic problems and proposed solutions to them.
4. Analyze the tradeoffs involved in various macroeconomic policy prescriptions.

Time Required

- Four class periods

Materials

Activities 47, 48, 49, and 50

Procedure

1. Have the students complete Activity 47; go over the answers.
2. Have the students complete Activity 48; go over the answers.
3. Have the students complete Activity 49; go over the answers.
4. Give the students 25 minutes to answer Activity 50 in order to simulate a long AP macroeconomics essay question.
5. Pass out the answers and have the students assess how well they did.

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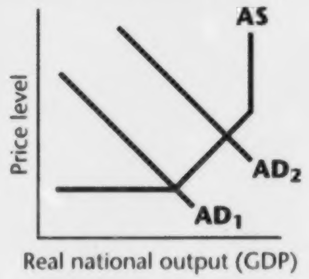
ACTIVITY 47 **ANSWER KEY**

The Expansion of the 1960s

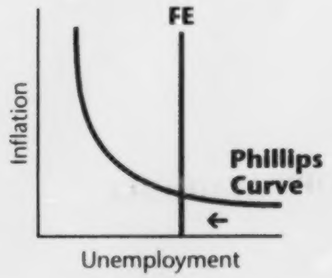
1. Explain the distinction between growth in actual GDP and growth in potential GDP. If actual GDP grows more slowly than potential GDP, why does unemployment rise?
   It is important for students to realize that an economy can be growing and at the same time falling below its potential output, and it is the gap between actual and potential output that determines unemployment.

2. Were the goals outlined by the Kennedy administration appropriate ones for an economy to achieve? Explain.
   Low inflation, low unemployment, and high growth are fairly standard goals. Low unemployment means operating at potential, and thus means not wasting resources. More rapid growth in potential should be distinguished from more rapid growth in actual output. The latter utilizes existing potential; the former creates more potential for the future. We all want low inflation, but the reason is not easy to explain. People generally assume that inflation gives them less real income, but that is usually not true—their wages usually keep up with prices. The problem with inflation is more complex. Inflation creates distortions that affect decision making (information about what is happening to relative prices is harder to get) and that makes the economy less efficient.

3. Was the concern that more rapid growth in GDP would cause a problem with inflation justified? Use both an aggregate demand and aggregate supply diagram and a Phillips curve to illustrate your answer.
   If the economy were below full employment, more rapid growth in output should not have created a problem with inflation. If the growth were enough to take the economy beyond full employment, then it would have been a problem.



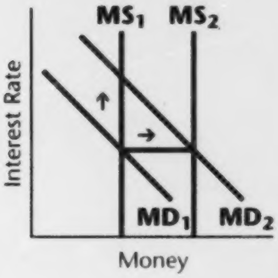
The aggregate supply curve becomes steeper as the economy comes closer to full employment. At first, an increase in AD would not affect prices much, but as the economy comes closer to full employment, prices would increase.



A Phillips curve would tell the same story. It is flat at high levels of unemployment, but inflation begins to increase as the potential output is approached.

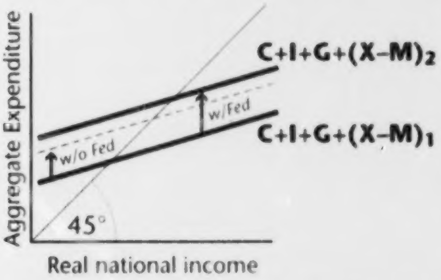
ACTIVITY 47 ANSWER KEY continued

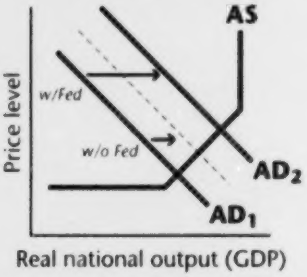
4. Why would the tax cut enacted in 1964 have caused the interest rate to rise without Federal Reserve action? What would the Federal Reserve have had to do to keep the interest rate from rising? Explain and show this with an appropriate graph.



By expanding the economy, a tax cut would increase the demand for money, causing the interest rate to rise. The Fed could prevent this by increasing the money supply.

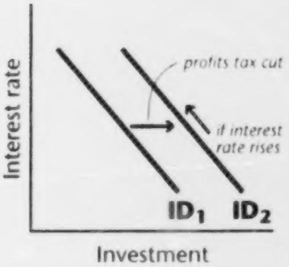
5. Use a total expenditure/45° diagram and an AD/AS diagram to show the effect of the tax cut with and without the Fed's actions to keep the interest rate from rising.





If the Fed did not increase the money supply to keep the interest rate from rising, investment would decrease, and the total expenditure line would not shift up as much from the tax cut. If the total expenditure line does not shift up as much, the AD curve will not shift out as much.

6. What would be the effect of the corporate profits tax cut on investment? Why? What would be the effect of the Fed's interest rate policy on investment? Why?



A corporate tax cut would make investment more profitable at any given interest rate. That is, it would shift an investment demand curve to the right. The Fed's policy would prevent the interest rate from rising. The higher interest rate would have reduced investment by moving businesses up along their investment demand curves. So there was an increase in investment from the tax cut and no reduction in investment from a higher interest rate.

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ACTIVITY 47 ANSWER KEY continued

7. Why would someone argue that the government's budget was in deficit because the economy was operating below its potential? Is there a conflict between a balanced-budget goal and the goal of achieving full employment with fiscal policy? Explain.
The distinction between a full-employment deficit and a cyclical deficit is a useful one. When the economy operates below potential, the government loses revenue. People aren't earning as much income, so they aren't paying as much in taxes; businesses aren't as profitable, so they aren't paying as much in taxes. The government also has increased welfare payment expenses when the economy is below potential and people are unemployed. Unfortunately, getting to potential with expansionary fiscal policy will increase the full-employment deficit while it is eliminating the cyclical deficit. That is, expansionary fiscal policy will not help the deficit, so there is a conflict between eliminating a deficit and using fiscal policy to achieve full employment.

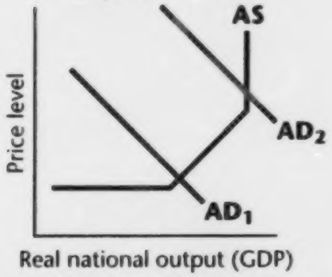
ACTIVITY 48 **ANSWER KEY**
The Inflation of the 1970s

1. What would cause the amount of unemployment at full employment to change?
It is important for students to realize that the economist's estimate of full employment is just that—an estimate. The only true test of an economy that is producing beyond full-employment output is that inflation starts to rise. Our analysis tells us that there can be unemployment at full employment if the unemployment does not result from a lack of jobs in general. Full-employment unemployment is frictional—the unemployed are between jobs, and the decision to be between jobs is one that they have made voluntarily; or full-employment unemployment is structural—the unemployed are not suited for the jobs available for reasons of location, skill, etc.

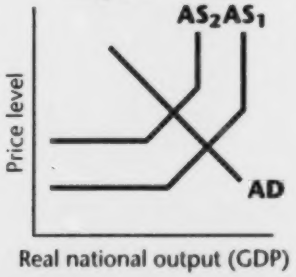
Various reasons have been given for the increase in frictional and structural unemployment from the mid-1960s to the mid-1970s. The most popular explanation is the increased proportion of women and those under 24 years of age in the labor force. These two groups typically have higher rates of frictional unemployment than other groups, so their increased importance in the labor force would arithmetically raise the unemployment rate. Another reason given is the increased coverage of unemployment insurance, with the result that the frictionally unemployed have less of an incentive to move to the available jobs. Finally, it has been argued that the oil price increases hurt some industries more than others, causing the distressed industries to lay off workers who were not suited for the jobs still available. Whatever the reason, it is clear that the rate of unemployment consistent with full employment rose from the mid-1960s to the mid-1970s.

2. Use an aggregate demand and supply (AD/AS) diagram to show the following:
   a. The cause of inflation in the late 1960s.
   b. The effect on inflation of the food and oil price increases in 1973, 1974, and 1979.

Graph A—1960s



Graph B—1970s

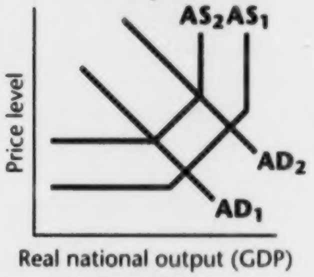


The increase in inflation in the 1960s was the expected demand-pull inflation that occurs when demand increases and the economy is operating close to full employment (see Graph A). The food and oil price increases in the 1970s were classic examples of cost-push inflation represented by the aggregate supply curve shifting up and to the left (see Graph B).

ACTIVITY 48 ANSWER KEY continued

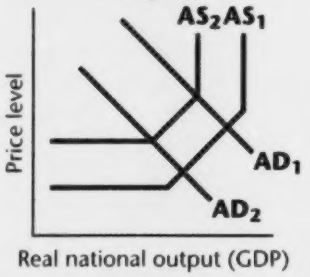
3. Use an AD/AS diagram to show the appropriate policy response to the oil price increases in the following instances:
   a. If unemployment were the main concern of policymakers.
   b. If inflation were the main concern of policymakers.
   c. If inflation and unemployment were of equal concern.

Graph A



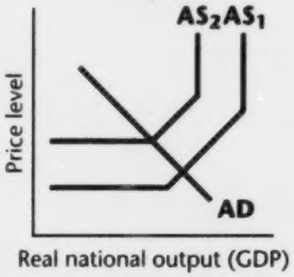
(concerned about unemployment)

Graph B



(concerned about inflation)

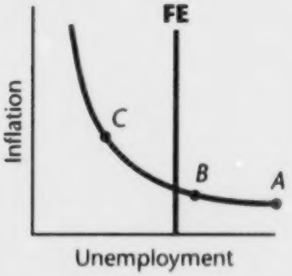
Graph C



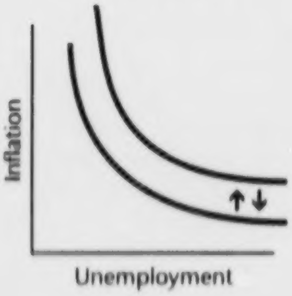
(concerned about both)

Inflation creates a dilemma for the policy maker. Using Keynesian fiscal policy, if inflation is fought, unemployment gets worse. If the policy maker reacts to higher unemployment, inflation gets worse. The policy maker who is concerned about both has no choice generally but to accept an increased amount of inflation and unemployment. Attempts to increase supply through tax policies may be an option.

4. Show the rising inflation of the late 1960s on a Phillips curve. Then show the effect of the food and oil price increases on the Phillips curve. How would the continuing high inflation of the 1970s have affected the Phillips curve? Explain.

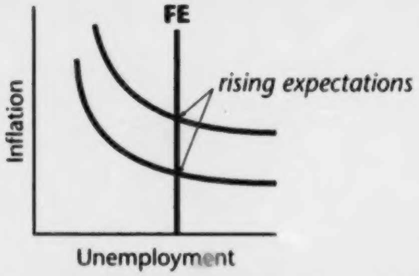


The Phillips curve is like the aggregate supply curve; it gets steeper in the vicinity of full employment. The expansion of the late 1960s moved us up the Phillips curve into its steep region. When the expansion began, it took the economy from point A to point B. As the expansion continued, it moved the economy from point B to point C.



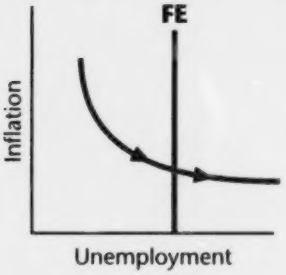
Cost-push factors create more inflation at any rate of unemployment, so they shift the Phillips curve up. But unless the inflation from oil price increases raises expectations of inflation, the upward shift in the Phillips curve is temporary. When oil prices stop increasing, the Phillips curve will shift back down because the decrease in resource costs increases AS.

ACTIVITY 48 ANSWER KEY continued



The Phillips curve is useful for showing the role of expectations of inflation during this period. Expectations are shown by the rate of inflation on the Phillips curve when the economy is at full-employment unemployment. At full employment, there is no pressure on prices (up or down) from the state of the economy, hence price changes are coming from expectations. Graphically, an increase in expectations will shift the Phillips curve up. The expansion moved the economy to a higher rate of inflation. As the higher inflation continued, the Phillips curve shifted up as expectations of inflation increased.

5. a. It has been argued that the main cause of inflation during this period (and of high inflation at any time) was a high growth rate of the money supply. It is true that from 1960 to 1966 money growth averaged 3 percent and averaged 6.3 percent from 1967 to 1982. Use a Phillips curve to show what would have happened to inflation and unemployment if money growth had been reduced at any time during the 1970s. Given that unemployment was averaging more than 6 percent, does that suggest any idea about why money growth wasn't reduced?

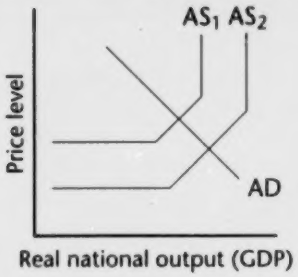


Reducing money growth would have moved us along the Phillips curve from left to right—less inflation but more unemployment. It would not have been a costless way to fight inflation.

b. As the inflation continued into the 1970s, it was argued that for a reduction in money growth to be fully effective in bringing down inflation, the Federal Reserve would need to convince people that it was serious about reducing money growth and would stick with the lower money growth until inflation was brought down. Why would it be important for the Fed to establish this credibility?
It would be important to change expectations of future inflation to expectations of future price stability. This would decrease aggregate demand. It is important to establish credibility because expectations of further inflation are actually what is causing further inflation.

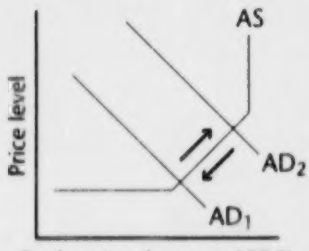
ACTIVITY 49 **ANSWER KEY**
Supply-Side Economics, Budget Deficits, and Tax Changes

1. Use an AD/AS diagram to explain the supply-side argument that tax cuts would increase employment and reduce inflation.



The increased work effort and the increased savings that were translated into increased investment both would increase our capacity to produce. This would be shown by a rightward shift in the aggregate supply curve. Prices would decrease and output would increase, thus increasing employment.

2. Explain how an expansionary fiscal policy combined with a contractionary monetary policy affects the interest rate. Does this help to explain the argument that the current budget deficit hurts investment and growth? Explain.



Looking at aggregate demand doesn't tell you what is going on behind the curve. In this case, the expansionary fiscal policy takes us to AD_2 while the contractionary monetary policy takes us back to AD_1. An expansionary fiscal policy raises the interest rate by itself. The interest rate rises even further with the contractionary monetary policy. With aggregate demand remaining unchanged, the decrease in investment caused by the higher interest rate will to some extent counteract the increase in government spending and/or the increase in consumption caused by tax cuts from the expansionary fiscal policy. Behind the scenes, the deficit has increased. It suggests that there is a connection between deficits and investment. The suggestion is even stronger if we reverse the scenario. A contractionary fiscal policy balanced by an expansionary monetary policy would decrease the deficit, decrease the interest rate, and increase investment.

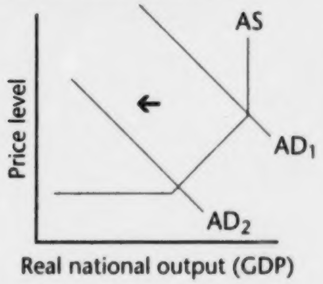
ACTIVITY 49 ANSWER KEY continued

3. a. If we consistently use fiscal policy to get the economy out of a recession and monetary policy to cool the economy down when inflation becomes a problem, what happens to the interest rate over time? to the budget deficit? to growth in potential output? Explain.

   Again, both an expansionary fiscal policy and a contractionary monetary policy raise the interest rate. A pattern of using fiscal policy to expand the economy and monetary policy to contract the economy would give us ever higher interest rates. That is not good for investment. Also, if government decreases taxes or increases spending to fight unemployment without reversing these actions to fight inflation, society will get a long-run increase in government spending relative to government revenue. In any given recession, it may seem more important to expand the economy than to balance the budget, but a lack of concern about the budget balance can lead to the kind of pattern of policy described here, and such a pattern is detrimental to long-run growth.

   b. Does this make the discipline of a balanced budget more meaningful? Explain.
   Yes, because an unbalanced budget will contribute to higher interest rates.

4. How would a Keynesian explain why the tax increase in 1990 would result in lower real GDP, higher unemployment, and a lower rate of inflation? Use an AD/AS diagram to illustrate this.



The tax increase would lower aggregate demand, which would lower output, employment, and the price level.

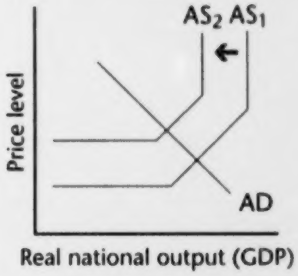
5. Harvard economist Robert Barro believes that President Bush was responsible for the poor economic performance in the latter half of his administration. According to Barro*:

> Free-market policies worked well in the United States in the 1980s and in other places at various times, so we apparently have decided to try something else.... Bush raised taxes and spending, increased the minimum wage rate and unemployment-insurance benefits, intensified the enforcement of regulations, and enacted an array of new intrusions in the form of the Americans-with-Disabilities Act, the Clean Air Act, and the Civil Rights Act.

   a. Is this a supply-side or a demand-side argument? Explain your answer.
   Supply-side. Higher costs of government regulations and lower incentives to work, save, and invest decreased aggregate supply.

ACTIVITY 49 ANSWER KEY continued

b. Illustrate this with an AD/AS diagram.



c. Barro writes that inflation didn't increase because of "a monetary policy that remained committed to low inflation."* What would this monetary policy have to be in order to keep inflation low? Would it be a tight money or easy money policy?
The monetary rule would be to increase the money supply at about the rate of increase in long-term growth. It would probably be perceived as a tight money policy.

6. a. Did President Clinton's policies work? Why or why not?
Answers will vary depending on Clinton's policies.

b. At the time you are reading this, what are the growth rate in real GDP, the unemployment rate, and the inflation rate?
Answers should represent most recent rates of real GDP, the unemployment rate, and the inflation rate.

ACTIVITY 50 **ANSWER KEY***

Analyzing Short-Run and Long-Run Effects of Monetary and Fiscal Policies

1. Suppose the following statements describe the current state of the U.S. economy.
   a. The annual growth rate of real Gross Domestic Product (GDP) is 5 percent.
   b. The unemployment rate is 6 percent.
   c. The Consumer Price Index (CPI) is rising at 9.5 percent annually.

2. Indicate which macroeconomic goals of the economy are being met and which are not.
   An unemployment rate of six percent is usually considered to put an economy in the vicinity of full employment. Pushing the economy further runs the risk of accelerating inflation, and the 9.5 percent rate of inflation indicates that inflation has already accelerated. Growth in the economy's capacity to produce is seldom as high as five percent. If unemployment were high, five percent growth would be good in that it would indicate that we were keeping up with growth in *capacity* and also employing previously unemployed resources. But with unemployment currently low, five percent growth would make unemployment still lower, which would aggravate the problem of high inflation.

3. Suppose the government pursues a new policy package that includes substantial tax cuts, an increase in government spending, and a decrease in the growth of the money supply.
   a. Assess whether these policies will help the economy meet the goals you outlined.
   Tax cuts and increased government spending represent an expansionary fiscal policy. A decrease in the growth of the money supply represents a contractionary monetary policy. Looking at the situation of the economy, an expansionary policy is not what is needed. To prevent inflation from rising, some contraction would be needed to reduce growth in real GDP. If GDP growth were reduced from five percent to, say, three percent, unemployment would stay about six percent and inflation should not get worse. If inflation were to be brought down, the contraction in the economy would need to be enough to reduce GDP growth below three percent so that unemployment would increase.

   From the combination of policy actions given, one cannot say what the net expansionary or contractionary effect of policy would be, but given that some degree of contraction is the desired effect of policy, the element of expansion in the policy mix is a mistake.

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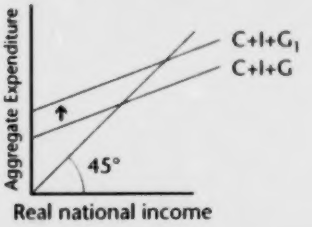
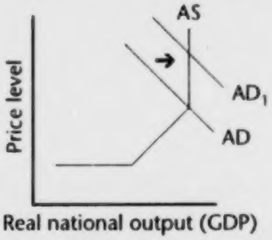
*Answer written by Robert Barry, former Chief Reader of AP Economics Examinations.

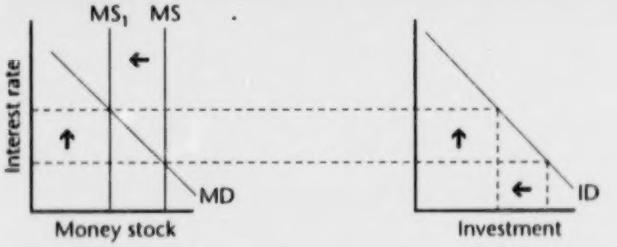
b. Explain in detail how and why each of these policies, alone and in combination, causes changes in:
   (1) Output.
   (2) The price level.
   (3) Employment.
   (4) Economic growth.

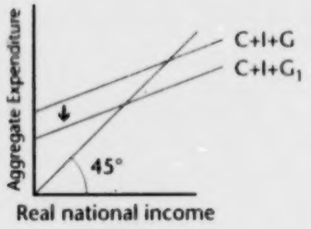
Fiscal policy expansion increases C+G in the total spending picture causing:

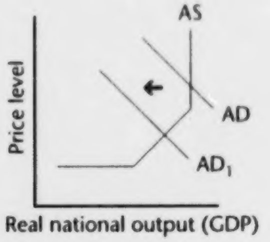




If we're at full employment, we're in the steep range of AS so the effect of the increase in AD is more on prices than on output. The contractionary monetary policy gets to C+I+G+(X-M) through the interest rate.







If the two policies are combined, it is possible to get no net change in total spending, but behind the constant spending total there is still the higher interest rate and lower investment. This will hurt the economy's future capacity growth.

Now, sorting all of this out, the basic elements of the answer are:

1) **Recognizing that inflation is the problem to address and that addressing inflation will mean slowing the growth in GDP.**
2) **Recognizing that the policy package is a combination of contractionary monetary policy and expansionary fiscal policy and thus is not a policy package focused on fighting inflation.**
3) **Describing through words and graphs the ways in which monetary and fiscal policies affect output, unemployment, prices, and economic growth.**

ACTIVITY 50 ANSWER KEY continued

Using a nine-point scale:

Eight-nine points	This answer would present a complete (or almost complete) coverage of the three elements.
Six-seven points	Compared to the eight-nine answer, a major portion of the three elements could be missed and the description of the workings of monetary and fiscal policy would be sketchier than in the eight-nine answer.
Four-five points	Maybe half of the major points would be covered; the analysis of fiscal and monetary policy would be rudimentary.
Two-three points	A glimmer of light here and there, but basically an answer that would cause you to doubt the student had taken the course.
One point	Words are written.

UNIT 5, LESSON 4

New Directions in Macroeconomic Analysis

Introduction and Description

Although economists agree much more than they disagree, the opinions of prominent economists on economic policy often conflict. This lesson leads students to understand why economists disagree, and this understanding should help them make their own judgments about economic policies.

The lesson concludes by having students compare and contrast the major macroeconomic theories, which are Keynesian, monetarist, and rational expectations. New classical economics includes monetarists and rational expectations theory.

Objectives

1. Explain why economists sometimes disagree on policy recommendations.
2. Analyze the assumptions, values, theoretical support, and applicable time periods underlying recommendations concerning monetary and fiscal policies that are in conflict.
3. Describe, compare, and contrast the Keynesian, monetarist, and rational expectations theories.
4. Illustrate with aggregate supply and demand diagrams the Keynesian, monetarist, and rational expectations theories.

Time Required

- Five class periods

Materials

1. Activities 51, 52, 53, and 54
2. Visuals 5.4, 5.5, 5.6, 5.7, 5.8, and 5.9

Procedure

1. Have the students read Part A of Activity 51 and then discuss the reasons that economists disagree.
2. Have the students read Part B of Activity 51, keeping in mind that they will be asked to analyze each professor's arguments on the basis of differences in time periods, assumptions, economic theories, and values.
3. Have the students look at the analysis of each professor's theories at the end of Activity 51. In class discussion, analyze the arguments of Professor Cut. Elicit answers from the class on each major point and record them on the board. Try to reach a consensus on each major point, time periods, assumptions, theoretical support, and values. At the end of the discussion, you may want to project a visual of the analysis of Professor Cut's arguments. Don't show any analysis for the other professors' arguments. Be flexible in comparing students' answers to the given answers. There are many correct ways to state these points.
4. Divide the class into three groups. Tell the first group that it will analyze the arguments of Professor U.R. Nutts, the second group the arguments of Professor E.Z. Money, and the third group the arguments of Professor Fred Critic.
5. Allow each group about 15 minutes to analyze its professor's arguments, using the analysis in Activity 51. Appoint a recorder for each group, or have each group choose a recorder to enter the group's conclusion on the Activity.
6. Solicit analysis from one group at a time. Have each group's recorder write the group's conclusions on the board. Have the rest of the class evaluate the conclusions. Compare the conclusions with those on the visual.
7. Ask the students which economist they agree with most, and why.
8. Use Visual 5.4 to discuss the Keynesian theory.
9. Use Visual 5.5 to discuss the monetarist theory.
10. Use Visual 5.6 to discuss the rational expectations theory.

LESSON 4 continued

11. Divide the class into groups, and have each group classify each idea in Activity 52 under Keynesian, monetarist, or rational expectations theory.
12. Now put three headings on the board and allow plenty of space to write under each. The headings are *Keynesian, Monetarist,* and *Rational Expectations.*
13. Have one student at a time classify an idea under one or more of the headings and write it on the board. Discuss each idea as it is classified. Is it classified correctly? Can it fit under more than one category? You should make the point that a lot of ideas fit into both the monetarist and rational expectations schools of thought. These two theories are often considered to be new classical economics. Why is this?
14. Use Visual 5.7 to show how the Keynesian theory can be illustrated on an AD/AS diagram.
15. Use Visual 5.8 to show how the monetarist theory can be illustrated on an AD/AS diagram.
16. Use Visual 5.9 to show how the rational expectations theory can be illustrated on an AD/AS diagram.
17. Have the students complete Activity 53.
18. Go over the answers to Activity 53 and stress the implications of the answers.
19. Have the students complete Activity 54 as homework if time permits. Discuss the main points of students' speech outlines.

ACTIVITY 51 **ANSWER KEY**
Why Economists Disagree

Part B. Listening in on a Discussion of Economists

Name of professor: **Professor Cut**

Major point: **Tax cut will stimulate economy.**

Time period: **Present and near future.**

Assumptions: **The administration's budget proposals are not inflationary.**

Theoretical Support: **Tax cuts stimulate business investment as well as spending by all private sectors and may encourage greater work effort.**

Values: **Economic freedom and distrust of big government.**

Name of professor: **Professor Nutts**

Major point: **Higher interest rates will cause recovery to fall.**

Time period: **Next year.**

Assumptions: **Deficits are large and getting larger.**

Theoretical Support: **Government borrowing is so large that it causes interest rates to rise and crowds out consumer and business borrowing.**

Values: **Tax cuts must be fair, and fairness means taxing the wealthier more than the poorer. Government must maintain economic security for Americans with low incomes.**

Name of professor: **Professor Money**

Major point: **Relatively free expansion of money will bring down interest rates and sustain recovery.**

Time period: **Near future.**

Assumptions: **Relatively free expansion of money supply by Fed will sustain the recovery.**

Theoretical Support: **Lower interest rates increase consumer spending and business investment. The primary effect of lower interest rates is on investment.**

Values: **A growing economy is desirable.**

Name of professor: **Professor Critic**

Major point: **There will be another recession.**

Time period: **One to two years from now.**

Assumptions: **Fed will continue past policies—policies that have brought about periods of inflation and recession.**

Theoretical Support: **Not enough money growth causes recession; too much money growth causes inflation.**

Values: **Steady economic growth without inflation or recession is desirable.**

ACTIVITY 52 **ANSWER KEY**
Sorting Out Macroeconomic Theories

Keynesian Theory

1. Aggregate supply is more horizontal.
2. Fiscal policy works better than monetary policy.
3. GDP = C + I + G is a key to understanding this theory.
4. Savings and consumption depend more on income than on interest rates.
5. Because of imperfect competition, markets do not always adjust back to full-employment equilibrium.
6. Government can and should play a positive role in stabilizing the economy.
7. Monetary policy works through interest rates.
8. The velocity of money is unstable.
9. The Fed should set interest rate targets.

Monetarist Theory

1. Aggregate supply is more vertical.
2. Wages and prices are flexible.
3. Effects of monetary policy influence aggregate demand more than effects of fiscal policy effects.
4. Active monetary and fiscal policies are generally ineffective in stabilizing the economy.
5. It is important that an economic policy be clear and consistent.
6. Fiscal and monetary policies have some short-term effects but have little influence in the long run.
7. MV = PQ is the key to understanding this theory.
8. Increase the money supply three to five percent a year to coincide with changes in real GDP.
9. Most markets are highly competitive.
10. Government fiscal and monetary policies usually cause more economic instability than stability.
11. Government that governs least governs best.
12. Inflation is caused by government creating too much money and by nothing else.
13. The Fed should set money supply targets.

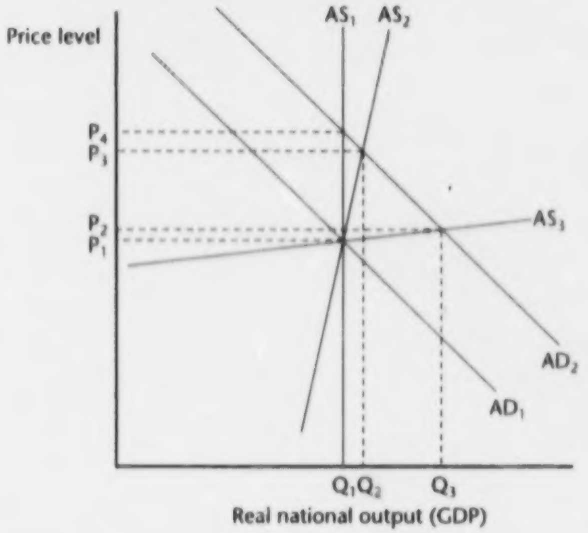
Rational Expectations Theory

1. Wages and prices are flexible.
2. Active monetary and fiscal policies are generally ineffective in stabilizing the economy.
3. It is important that an economic policy be clear and consistent.
4. Most markets are highly competitive.
5. Expectations are forward-looking.
6. Government fiscal and monetary policies usually cause more economic instability than stability.
7. The aggregate supply curve is always vertical.
8. Government that governs least governs best.
9. People's expectations regarding monetary and fiscal policies often make these policies ineffective.

ACTIVITY 53 **ANSWER KEY**
Graphing Macroeconomic Theories

Study the diagram and answer the questions that follow by crossing out the incorrect words in parentheses or filling in the correct answers.

Graphing Macroeconomic Theories



1. AS_1 is the *(~~Keynesian~~/~~monetarist~~/rational expectations)* supply curve. AS_2 is the **monetarist** supply curve, and AS_3 is the **Keynesian** supply curve.

2. Regardless of which is the economy's supply curve, if the aggregate demand curve is AD_1, the equilibrium real national output is ***Q_1***, and the equilibrium price level is ***P_1***.

3. Should aggregate demand increase from AD_1 to AD_2 in the:

   a. Monetarist model, the equilibrium real national output would *(increase to/~~decrease to~~/~~remain constant at~~)* ***Q_2***, and the equilibrium price level would *(increase to/~~decrease to~~/~~remain constant at~~)* ***P_3***.

   b. Keynesian model, the equilibrium real national output would *(increase to/~~decrease to~~/~~remain constant at~~)* ***Q_3***, and the equilibrium price level would *(increase to/~~decrease to~~/~~remain constant at~~)* ***P_2***.

   c. Rational expectations model, the equilibrium real national output would *(~~increase to~~/~~decrease to~~/remain constant at)* ***Q_1***, and the equilibrium price level would *(increase to/~~decrease to~~/~~remain constant at~~)* ***P_4***.

Answers to Sample Multiple-Choice Questions

1. c
2. a
3. e
4. b
5. d
6. a
7. d
8. a
9. b
10. a
11. a
12. d
13. b
14. a
15. a
16. d
17. c
18. a
19. d
20. e

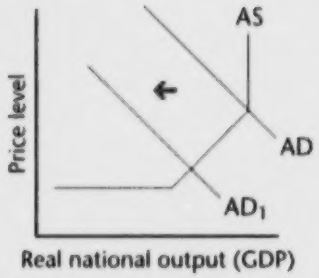
Answers to Sample Short Essay Questions

1. To encourage long-run growth, the expansionary policy should stimulate investment as much as possible. An expansionary monetary policy would lower the interest rate and thus stimulate investment. To stimulate investment, an expansionary fiscal policy should consist of business tax reductions. For these tax cuts to have their full effect on investment, monetary policy should be used to keep the interest rate from rising. A combination of business tax cuts and a monetary policy expansionary enough to lower the interest rate would be even better for growth.

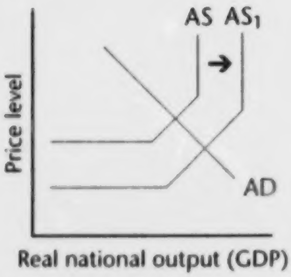
2. Reducing government spending will have a more powerful effect on aggregate demand than an increase in taxes because of the balanced budget multiplier. Both policies will decrease aggregate demand. Depending on where the economy is on the aggregate supply curve, the policy will decrease output, prices, or both.

   However, less government borrowing will cause less crowding out which should make the reduction in aggregate demand less.

   Also, lower taxes might increase aggregate supply by increasing people's incentives to work, save, and invest.



Tax increase and spending custs



Spending cuts only

3. The interest rate depends on the supply of and demand for money. The Fed controls the supply of money, but the demand for money is determined by how much money consumers, businesses, and government want to borrow. If the demand changes, the Fed can adjust the supply so that it can reach an interest rate target. However, if the Fed increases the money supply three to five percent a year, the interest rate will be determined by the demand for money. Monetarists believe that the money supply works directly on output and the price level. Keynesians believe that monetary policy works indirectly through interest rates.

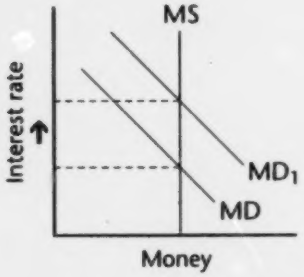
4. The Phillips curve indicates that there is an inverse relationship between unemployment and inflation. The higher the unemployment rate, the lower the inflation rate. The higher the inflation rate, the lower the unemployment rate. This tradeoff occurs because of the effects of aggregate demand on output, employment, and the price level. Increasing aggregate demand increases output and employment but also puts upward pressure on prices. Decreasing aggregate demand reduces inflation but also can decrease output and employment.

   According to the new classical economists, there is a long-run natural rate of unemployment, so adjusting aggregate demand changes only the price level. Therefore, the long-run Phillips curve is vertical.

ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

5. Greater borrowing by the federal government increases the demand for money which, all other things equal, raises the interest rate. This higher interest rate makes it more expensive for consumers and businesses to borrow money, thus crowding them out of the market for loanable funds. This lowers spending on consumer durable goods, investment goods, and housing, which can cause higher unemployment and lower economic growth.

   A reduction in investment lowers the productive capacity of the economy in the future. Therefore, some of the positive effects of an expansionary fiscal policy are wiped out by the crowding-out effect.



Higher government demand increases the demand for money which crowds out private investment.

6. The interest rate is determined by the supply of and demand for money. An expansionary fiscal policy also increases government borrowing. This increase in the demand for money increases interest rates. A contractionary monetary policy also increases interest rates because the growth in the supply of money is less rapid. Therefore, higher interest rates lower investment, which lowers long-run economic growth.

ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

7. The scoring basis for AP question 7 is as follows:

Part a. (1 point)

Expansionary monetary policy will decrease short-term interest rates by increasing the money supply.

Part b. (2 points):

The decrease in interest rates results in an increase in investment and other interest-sensitive expenditures. The composition of GDP changes with the increase in investment.

one point—Decrease in interest rates → increase in investment and other interest-sensitive expenditures.

one point—Increase in investment increases the investment component of aggregate expenditures relative to other components. A shift of the aggregate expenditures curve upward with only investment changing was an acceptable answer for this point.

Part c. (2 points):

The increase in investment increases the capital stock resulting in a rightward shift of the aggregate supply curve and an increase in potential GDP.

one point—Shift in AS curve to the right.

one point—Increase in potential GDP.

Note: If a student discusses the effects of expansionary and contractionary monetary policy without saying which policy increases economic growth, the student can receive only one point for the answer. The student would have a score of one for the entire question.

Alternative Explanations:

The monetarist answer is: The Fed should follow a monetary rule with the money supply growing at a constant (five percent???) rate (one point). This will lead to a stable interest rate and thus to stable investment (one point). With regard to the composition of aggregate expenditure, the investment component would have less variance (one point). The stable investment will cause the long-run aggregate supply (LRAS) to shift to the right (one point) and potential GDP to increase (one point).

8. The key point in rational expectations theory is that people behave rationally. They gather information, process that information, and make intelligent expectations about how events and decisions will affect them monetarily. In highly competitive markets, people will anticipate the effects of monetary and fiscal policy changes and act defensively to protect themselves from these changes. These acts can negate the effects of the policy changes. For example, the government might conduct an expansionary fiscal policy, and the Fed accommodates this with an expansionary monetary policy. The aim of the policies is to increase output and employment. However, businesses and consumers see the policies as inflationary and act to protect themselves from the coming inflation. Businesses borrow more, and workers push for higher wages. This causes wage-price inflation and higher interest rates. Rather than getting an increase in investment spending and real GDP, the government policies cause more inflation.

Answers to Sample Long Essay Questions

1. Basically the point distribution is one point for Part a; four for Part b; and four for Part c.

Part a: (one point)
Inflation is the problem.

NOTE: The student may also indicate that the high interest rate is a problem. No penalty or credit given because this is nominal interest rate not real interest rate and, hence, is just a reflection of the inflation problem.

Part b: (four points)
Two fiscal policies are decreasing government spending and increasing taxes. A decrease in G will directly decrease AD. An increase in taxes will decrease C (or I if corporate taxes discussed) and directly decrease AD. Output, employment, and prices will decline. Interest rates will decline because (i) decrease in government spending reduces the demand for funds in the bond market, and/or (ii) decrease in income decreases the demand for money. Alternatively, if the student demonstrates an understanding of the relationship between the inflation rate and the nominal interest rate and states that the reduction in inflation will reduce nominal interest rates, the answer may get credit. It will not receive credit, however, if students stated that high nominal rates are part of the problem for Part a.

one point—Two correct fiscal policies (one-half point for each policy).
one point—AD decreases with an explanation of either the decrease in G or the increase in tax is sufficient.
1/2 point—Output and employment decrease.
1/2 point—Price level decreases.
one point—Nominal interest rate decline with explanation.

NOTE 1: If the student shifts both the AS and AD curves and indicates a confusion between movement along and shift in AS, then he/she does not receive the points for output, employment, and price changes.

NOTE 2: If the student has the money supply decreasing because of the decrease in G or the increase in taxes, then the student cannot receive more than three points in Part b, assuming all else is correct including the interest-rate effect.

Part c: (four points)
Two monetary policies are selling government securities (OMO), increasing reserve requirement, increasing discount rate, moral suasion, etc. (Policies must be contractionary!!) The decrease in the money supply will result in an increase in the interest rate, which in turn decreases investment and/or interest-sensitive components of spending. The decrease in investment decreases AD, which drives employment, output, and prices down.

one point—Two correct monetary policies (one-half point per policy). (If the student gives two correct and one wrong policy, give the point.)
one point—Increase in interest rate → I and other interest rate sensitive expenditures decline with correct explanation.
one point—Decrease in AD due to investment decline.
one point—Decrease in employment, output, and price level.

ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

AP Question 1 continued

Alternative Explanations:

The monetarists would say that fiscal policy would not be as effective as Keynesians would and that it was probably expansionary fiscal policy which got us into the current inflation. The monetarists would use the two tools of monetary policy to maintain a constant money supply growth to decrease inflationary expectations.

If the student uses the Keynesian Cross model, give credit. However, they must give a correct explanation for the decrease in price.

2. Basically the point distribution is four points for Part a; four for Part b; and one for Part c.

Part a: (four points)

We would like to have the student recognize that there is a balanced budget multiplier effect so that this policy change will have a net positive impact on the AD curve. However, since we expect students to address the increase in government spending and increase in taxes separately, we have set the grading standards to allow for partial credit for each change, with full credit given only if they show/explain that there is a net positive effect on AD. For full credit the student must explain the interest rate effect.

one point—If student shows/explains that increase in G → increase in AD → increase in GDP and increase in P.

one point—If student shows/explains that increases in taxes → decrease in AD → decreases in GDP and decreases in P.
Alternatively: If student asserts that the increase in G and increase in taxes have offsetting effects without discussing the effects on AD explicitly, give one point.

one point—For explicit discussion of the balanced budget multiplier or alternative wording which shows that student understands that the positive effect of increases in G on AD exceeds the negative effect of increases in taxes on AD.

one point—Interest rate effect: they must explicitly state that there will be an increase in interest rates from the increase in the demand for money due to the increased output.

Part b: (four points)

The Federal Reserve buys bonds in OMO thereby increasing the money supply. Interest rates decline because (i) the price of bonds increases or (ii) more loanable funds available. The decrease in interest rates stimulates investment and, perhaps, consumption spending resulting in an increase in output and employment. Prices rise to induce additional output. AD increases → P increases.

one point—Increase in the quantity of money decreases the interest rate.
one point—Lower interest rate increases investment (consumption).
one point—Increase in investment shifts the AD → and employment increase.
one point—Prices increase due to increase in AD.
Alternative: The monetarist answer is acceptable if explicitly stated.

ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

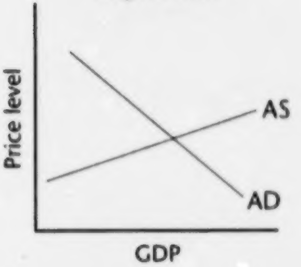
AP Question 2 continued

Part c: (one point)

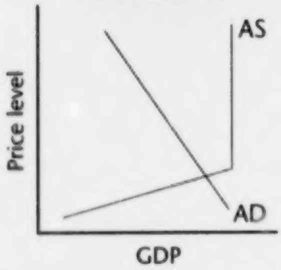
The combined effects of the two policies are (i) an increase in output, employment, and prices and (ii) net effect on interest rates is indeterminate.

one point—consistent answer which addresses all four variables—output, employment, prices, and interest rates.

3.



Keynesian



Monetarist

a. On the fiscal policy side, Keynesians believe you can fight inflation by decreasing AD (raise taxes, lower government spending, or both). Monetarists believe the effects of fiscal policy on AD are weak, and therefore we should not use fiscal policy to correct an inflation problem.

On the monetary policy side, Keynesians believe you should increase interest rates by decreasing the rate of growth in the money supply. Monetarists would consistently increase the money supply three to five percent a year. They believe a change in the money supply is the most important way to control output, price, and employment. They would not use the money supply to adjust interest rates. They believe there is a direct connection between the money supply and output.

b. On the fiscal policy side, Keynesians would fight recession by increasing AD (decrease taxes, increase government spending, or both). Monetarists would not use fiscal policy. They would follow the same policy described in Part a.

On the monetary policy side, Keynesians would decrease interest rates by increasing the rate of growth in the money supply. Monetarists would follow the same monetary policy described in Part a.

c. The Keynesian model does not provide a direction for curing stagflation. This is because Keynesians believe inflation is caused by too much AD and unemployment by too little AD. On the monetary side, fighting stagflation is not addressed by the Keynesian model. Monetarists would follow the same policy described in Part a.

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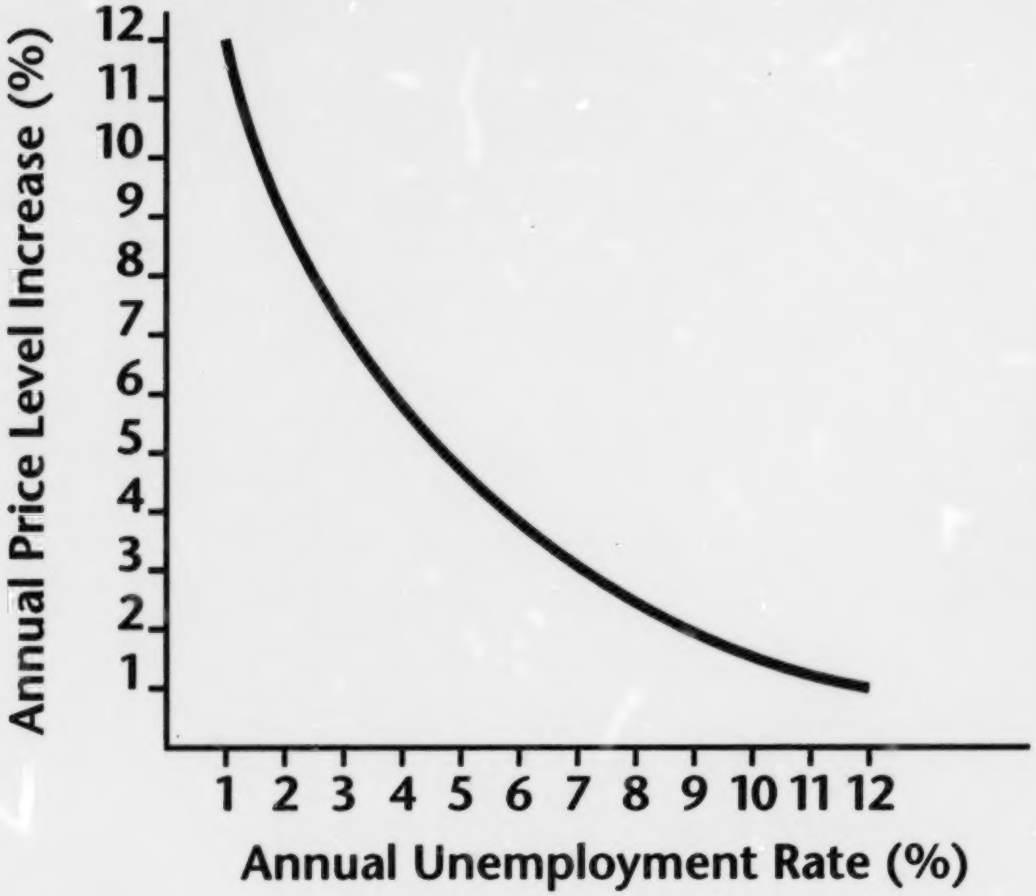
Visual 5.1

The Phillips Curve (Short Run)



1. What relationship does this diagram show between the rate of inflation and the rate of unemployment?
2. If aggregate supply decreased, would there be a movement up the Phillips curve or a shift of the Phillips curve outward? Why?
3. What would it mean if the long-term Phillips curve were vertical?

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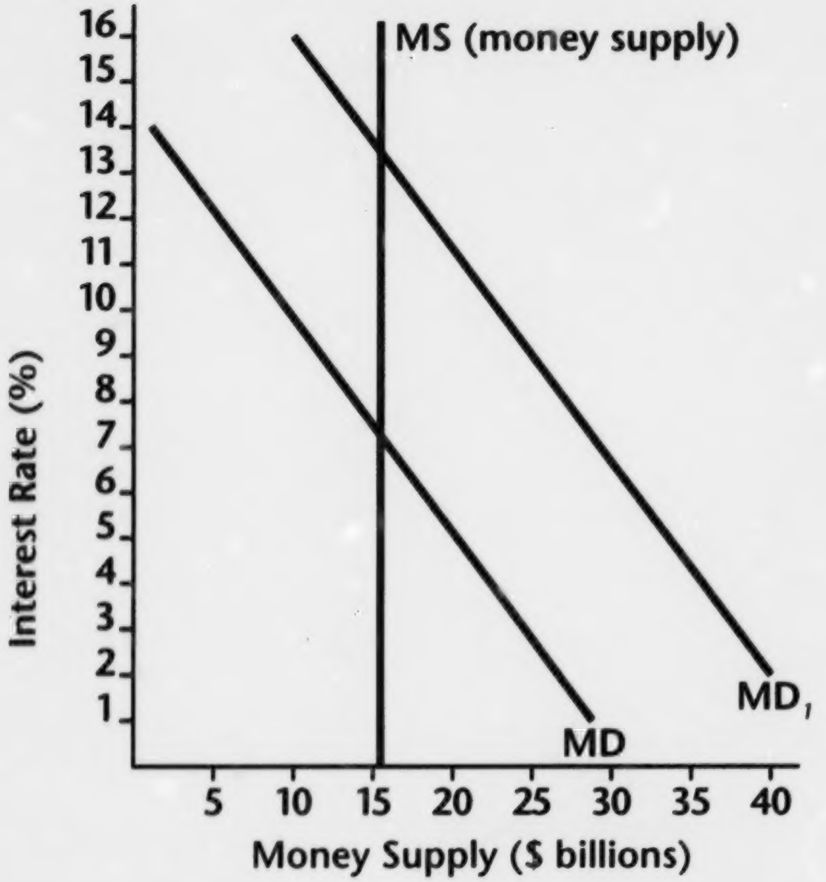
Visual 5.2

The Crowding-Out Effect



1. What will government borrowing do to the demand for money?
2. How will this increased demand for money affect interest rates?
3. If interest rates are higher, what will happen to private investment and consumer borrowing? Why?

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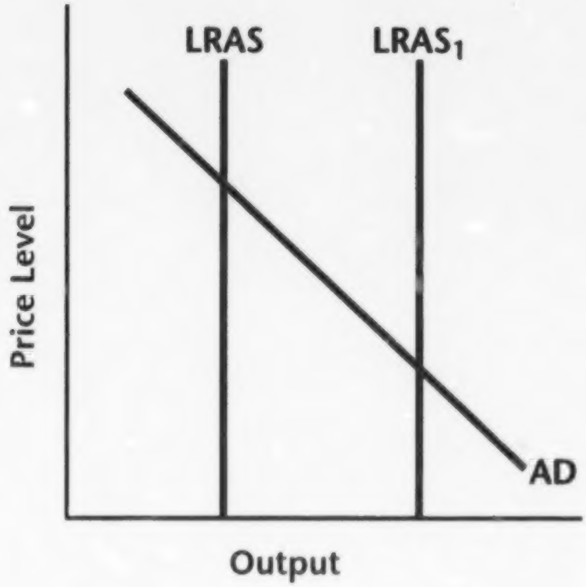
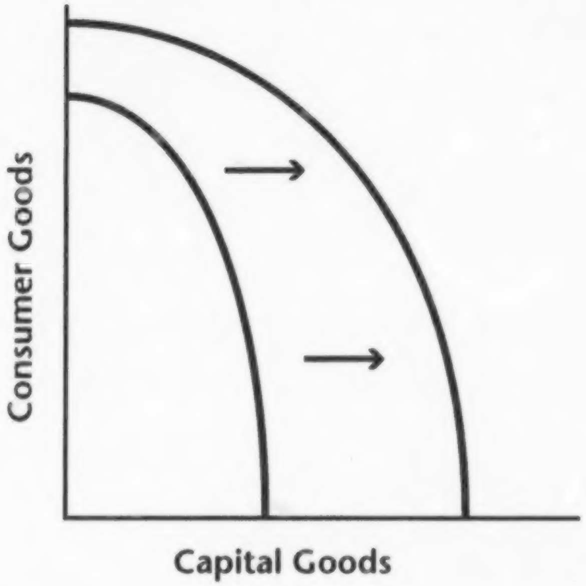
Visual 5.3

Economic Growth, Long-Run Aggregate Supply, and the Production Possibilities Curve





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Visual 5.4

Keynesian Theory

Ideological orientation: The economy can be "fine tuned" through government taxing and spending decisions.

Analytical framework: Demand creates its own supply.

$$C + I + G = GDP$$

Economic assumptions:

1. Wages and prices are not flexible downward.
2. Saving depends on income.
3. Investment depends on expected profits and interest rates.

Monetary policy:

1. It works through interest rates and investment.
2. It works better to stop inflation than to cure recession. "You can lead a horse to water but you can't make it drink."

Fiscal policy:

1. To increase GDP, lower taxes and increase government spending.
2. To correct inflation, raise taxes and decrease government spending.

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Visual 5.5

Monetarist Theory

Ideological orientation: The government should increase the money supply by 3-5% each year and do little else to control the economy.

Analytical framework: MV = PQ

Economic assumptions:

1. Real GDP can increase only by about 3-5% a year.
2. The velocity of money is basically stable.

Monetary policy:

1. Increase M 3-5% a year.
2. A change in the money supply directly affects prices and output.

Fiscal policy:

1. It will not work to influence real GDP in the long run.
2. It might have some short-run effects.

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Visual 5.6

Rational Expectations Theory

Ideological orientation: "Since neither fiscal nor monetary policy will work, it is best not to try anything fancy."

Analytical framework: Private economic agents are intelligent decision makers and can be expected to take the effects of government policy changes into account in deciding their behavior.

Economic assumptions:

1. People are rational decision makers.
2. Expectations are forward looking.
3. People act defensively to offset the effects of government policy.

Monetary policy: The 3-5% rule is OK. It should be predetermined to stabilize expectations.

Fiscal policy: It is ineffective because of people's reaction. "Fool me once—shame on you. Fool me twice—shame on me."

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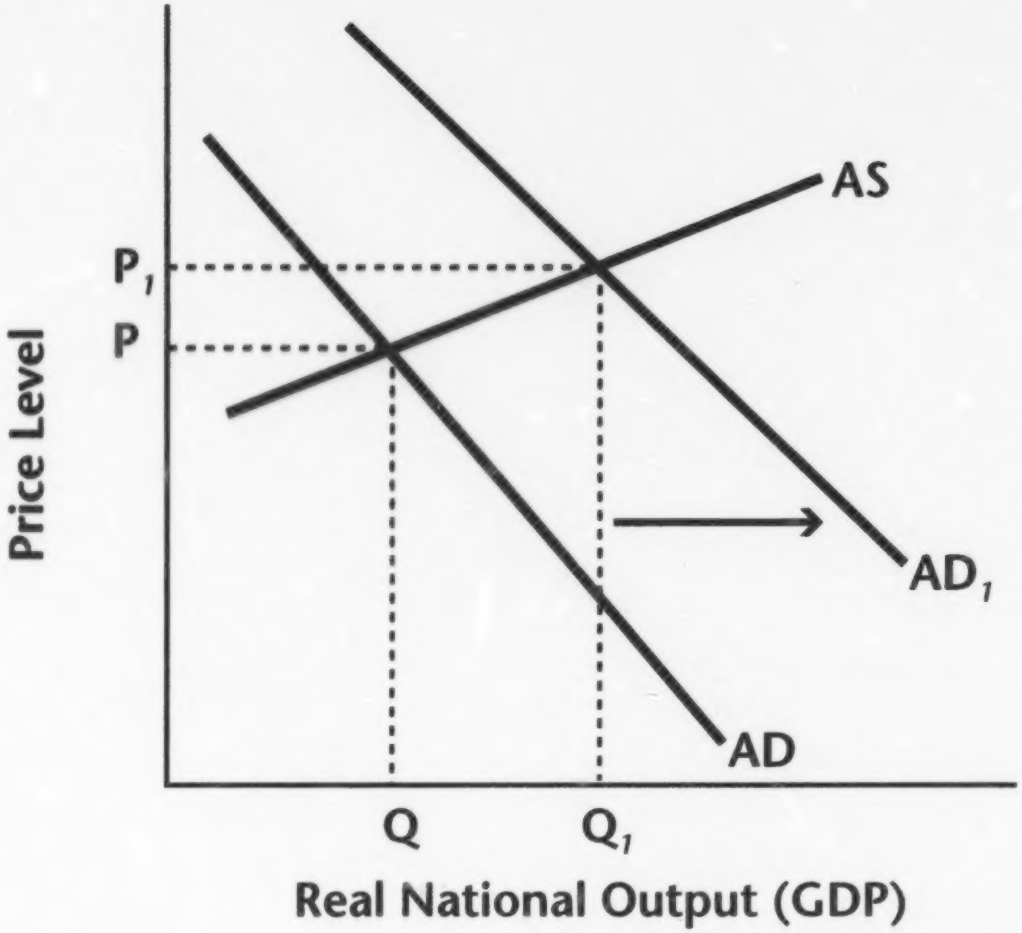
Visual 5.7

Graphing Keynesian Theory



1. Why do Keynesians believe the aggregate supply curve is relatively horizontal?
2. Does an increase in aggregate demand have a larger effect on the price level or on output? Why?

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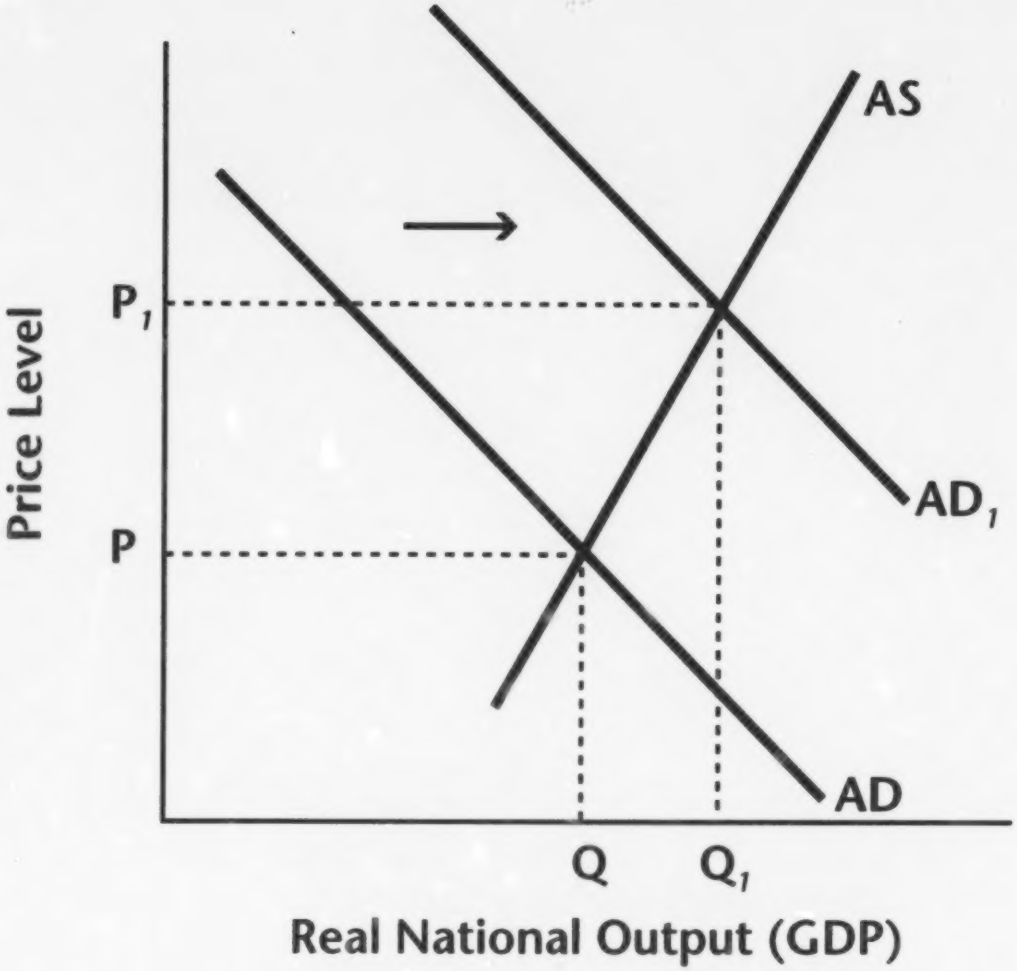
Visual 5.8

Graphing Monetarist Theory



1. Why do monetarists believe the aggregate supply curve is relatively vertical or perfectly vertical?
2. Does an increase in aggregate demand have a larger effect on the price level or on output? Why?

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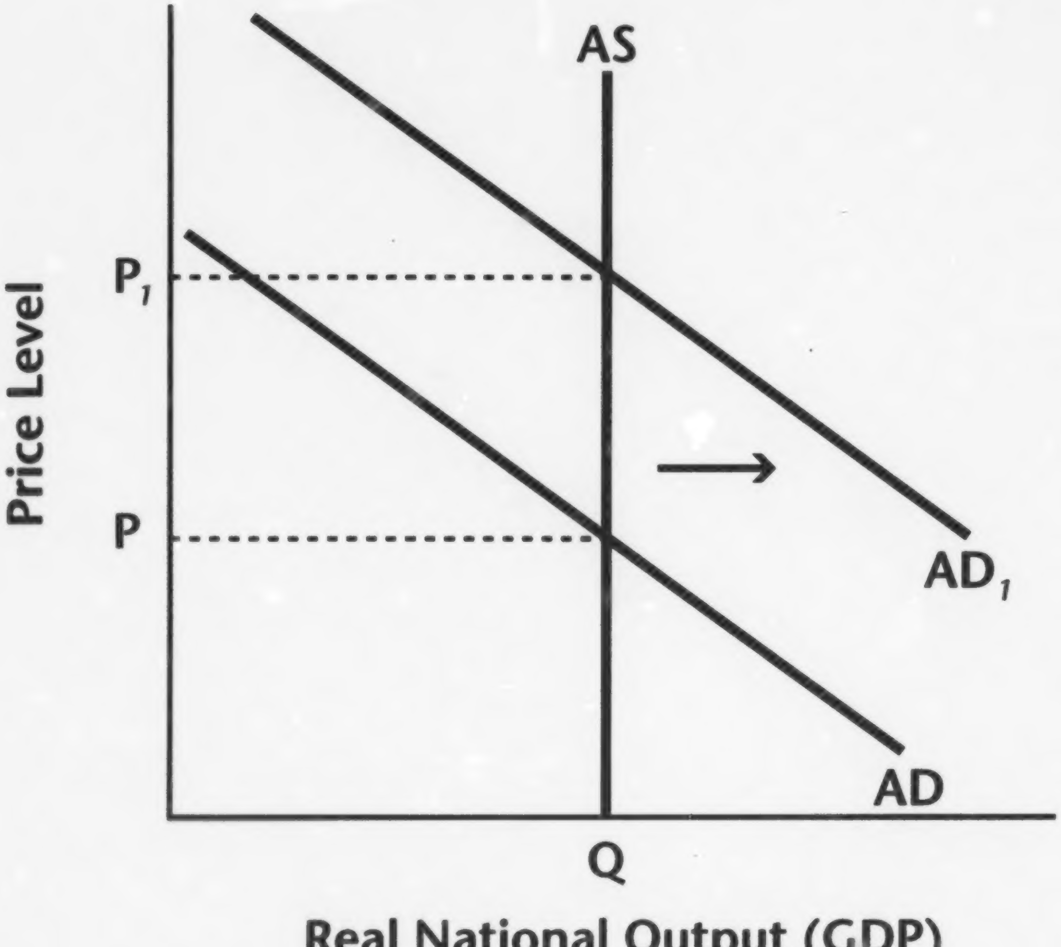
Visual 5.9

Graphing Rational Expectations Theory



1. Why does rational expectations theory believe the aggregate supply curve is vertical?
2. What is the effect of an increase in aggregate demand on the price level? On the level of output?

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Macroeconomics

Unit 6

The United States in a Global Economy

12 Days

Unit Overview

The focus of this unit is world trade, the conduct of commerce among individuals, firms, and governments. The unit covers concepts such as opportunity cost, comparative and absolute advantage, free trade, protectionism, balance of payments, and exchange rates. Most important, this unit provides students with the opportunity to use economic reasoning to answer some puzzling questions unique to world trade activity. The College Board indicates that eight to twelve percent of the macroeconomics exam will cover international trade topics.

Textbook Assignments

Baumol and Blinder, Chapters 35, 36, 37

McConnell and Brue, Chapters 37, 38

Miller, Chapters 33, 34

Planning Ahead

Of the several important ideas in this unit, the most important is the law of comparative advantage. Students will be expected to determine comparative advantage by using inputs, outputs, and production possibilities curves. There are four Activities on comparative advantage. Comparative advantage is also on the AP Microeconomics Exam.

Beginning in 1996, students will be expected to use graphs to analyze economic situations. Supply and demand graphs can be used to analyze the effects of tariffs and quotas as well as to determine exchange rates. We have provided exercises on these topics.

In the past, AP essay questions have concerned the international effects of monetary and fiscal policies. Two of these past essays are in the sample essay questions for this unit. McConnell/Brue and Miller do not do an adequate job covering the international effects of monetary and fiscal policies. Baumol/Blinder's Chapter 37 provides excellent coverage of the international effects of monetary and fiscal policy interactions.

Unit 6 Activities

Activity 55	The Iowa Car Crop
Activity 56	Determining Comparative Advantage
Activity 57	The Gains from International Trade
Activity 58	Economic Efficiency and the Gains from Trade
Activity 59	Barriers to Trade
Activity 60	Imbalance of Payments
Activity 61	Using Foreign Exchange Rates
Activity 62	Using Supply and Demand to Analyze Exchange Rates
Activity 63	The International Effects of Monetary and Fiscal Policies
Activity 64	The International Way of Thinking

Visuals

Visual 6.1	Absolute Advantage and Comparative Advantage
Visual 6.2	Determining Comparative Advantage (Output Method)
Visual 6.3	Determining Comparative Advantage (Input Method)
Visual 6.4	The Economic Effects of a Tariff
Visual 6.5	The Economic Effects of a Quota
Visual 6.6	Evaluating the Arguments for Protectionism

Sample Unit 6 Plan

Week 1	**Week 2**	**Week 3**
☐ 1. Discuss benefits of international trade. 2. Have students complete Activity 55; discuss the answers. 3. Use Visual 6.1 to distinguish between absolute and comparative advantage. 4. Assign: Baumol, Chap. 35; McConnell, Chap. 37; Miller, Chap. 33.	☐ 1. Use current figures to discuss balance of trade and balance of payments. 2. Have students read the first page of Activity 60 and discuss it.	☐ Review for test using Sample Multiple-Choice and Essay Questions.
☐ 1. Use Visual 6.2 to illustrate comparative advantage using outputs. 2. Use Visual 6.3 to illustrate comparative advantage using inputs. 3. Have students complete Activity 56; discuss the answers. 4. Assign Activities 57 and 58.	☐ 1. Have students complete Activity 60; discuss the answers. 2. Introduce exchange rates. 3. Assign Activity 61.	☐ Unit Test.
☐ 1. Discuss the answers to Activities 57 and 58. 2. Introduce barriers to trade and their effects.	☐ 1. Go over answers to Activity 61. 2. Have students complete Activity 62; discuss the answers. 3. Assign Baumol, Chap. 37.	☐
☐ 1. Use Visual 6.4 to explain the effects of a tariff. 2. Use Visual 6.5 to explain the effects of a quota. 3. Use Visual 6.6 to discuss the arguments for protectionism.	☐ 1. Discuss how monetary and fiscal policies affect exchange rates and the effects of changes in exchange rates. 2. Have students complete Activity 63 and discuss it. 3. Assign Activity 64.	☐
☐ 1. Continue discussion of protectionism. 2. Have students complete Activity 59; discuss the answers. 3. Assign: Baumol, Chap. 36; McConnell, Chap. 38; Miller, Chap. 34.	☐ Discuss the answers to Activity 64.	☐

UNIT 6, LESSON 1

Why People and Nations Trade

Introduction and Description

One idea that almost all economists agree on is that people and nations gain when they can sell something they can produce at a relatively low opportunity cost and use the income they receive to buy things that they can produce only at a relatively high opportunity cost.

This lesson begins with a reading without formulas or technical language that illustrates the benefits of trade. Then students practice solving problems that use inputs, outputs, and production possibilities curves to illustrate the law of comparative advantage. The law of comparative advantage will be covered on both the Microeconomics and Macroeconomics AP exams, and students will be expected to recognize comparative advantage using input and output analysis.

Objectives

1. Describe reasons people and nations gain when they trade.
2. Distinguish between *absolute advantage* and *comparative advantage.*
3. When given data, determine absolute and comparative advantage.
4. Analyze comparative advantage in terms of opportunity costs.
5. Describe and give examples of the law of comparative advantage.
6. Illustrate comparative advantage by using inputs, outputs, and production possibilities curves.
7. Describe, analyze, and evaluate the case for free trade.

Time Required

- Two and one-half class periods

Materials

1. Activities 55, 56, 57, and 58
2. Visuals 6.1, 6.2, and 6.3

Procedure

1. Begin with a discussion on the benefits of trade. Ask the students what life would be like if every person had to be totally self-sufficient and could not specialize and trade. Emphasize the point that it is individuals, not nations, that trade. However, specialization and trade can be accomplished both domestically and internationally. The more we trade, the better off we all are.
2. Have the students read Activity 55 and answer the questions.
3. Discuss the answers to the questions in Activity 55. Be sure to relate trade to efficiency and explain that the goal of international trade is to produce more and better goods and services from our scarce resources.
4. Use Visual 6.1 to distinguish between absolute and comparative advantage. Provide examples of absolute and comparative advantage. Discuss the three examples on Visual 6.1.
   a. What if a lawyer can type faster than any secretary she can hire? The lawyer has an absolute advantage in the practice of law and in typing. Should she hire the secretary? (Yes, because the opportunity cost of the lawyer's time spent as a secretary is very high, perhaps $100 an hour or more. She could hire more than one secretary for that and still be ahead.)
   b. The doctor/nurse situation is the same as the lawyer/secretary situation.
   c. Babe Ruth was an outstanding hitter and pitcher. Although he was a better pitcher than many of the other Yankee pitchers, he specialized in hitting where he had a comparative advantage. It worked, and the Yankees won a lot of pennants.
5. Use Visual 6.2 to illustrate absolute and comparative advantage using outputs.

LESSON 1 CONTINUED

6. Use Visual 6.3 to illustrate absolute and comparative advantage using inputs.
7. Have the students read Part A of Activity 56 and discuss how comparative advantage can be illustrated using inputs and outputs. In both cases, one has a comparative advantage in the good that has the lowest opportunity cost. Opportunity costs or relative costs of production determine comparative advantage.
8. Have the students do the practice problems in Part B; discuss the answers.
9. Illustrate comparative advantage using production possibilities curves.
10. Have the students complete Activity 57; discuss the answers.
11. Have the students complete Activity 58; discuss the answers.

ACTIVITY 55 **ANSWER KEY**
The Iowa Car Crop

1. Why are consumers hurt if government policies favor Detroit car makers rather than Iowa farmers?
If government policies favor Detroit, consumers have fewer choices. Also, if Detroit carmakers are less efficient than Iowa farmers, cars will cost more.

2. Why does trade result in the most efficient production of goods and services?
Trade allows scarce resources to be used in the most efficient way. It provides for specialization and trade.

3. Why do people and nations gain when they trade?
They gain efficiency and can produce and consume more goods and services from their scarce resources.

4. True, false, or uncertain, and why? "The economic goal of international trade is to maximize our exports and to provide jobs for Americans."
***False*. The purpose of trade is to improve the welfare of consumers. "Consumption is the sole end and purpose of all production," said Adam Smith, "and the interest of the producer ought to be attended to only as far as it may be necessary for promoting that of the consumer." The purpose of trade is to improve economic efficiency and to provide more and better products for consumers.**

ACTIVITY 56 **ANSWER KEY**
Determining Comparative Advantage

Part B. Practice Problems.
Circle the product that should be produced by each person or country. Then circle "output" or "input" to show whether it is an output or an input problem. Use scratch paper to set up the opportunity cost of each product. The first one is completed for you.

1. Anna and Barry can produce the following units of potatoes and cabbage with the same amount of labor.

Potatoes and Cabbage

	Potatoes	*Cabbage*	
Anna	100	$\boxed{200}$	[✓ output]/ input
Barry	$\boxed{120}$	150	

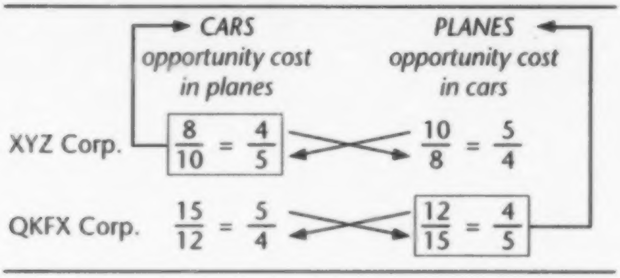
Anna has an absolute advantage in cabbage while Barry has an absolute advantage in potatoes so they each produce the product for which the person has an absolute advantage.

2. Number caught per day.
Henry—6 antelope
John—24 deer
output
John has an absolute advantage in both. Output = over.

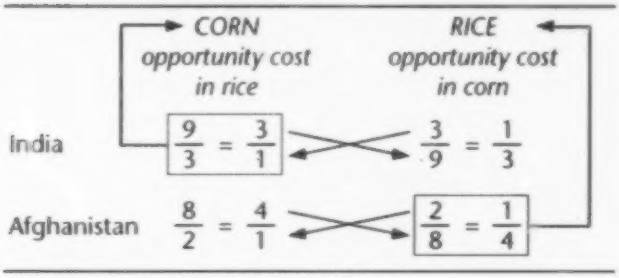
	DEER opportunity cost in antelope	*ANTELOPE opportunity cost in deer*
Henry	$\frac{6}{4} = \frac{3}{2}$	$\boxed{\frac{4}{6} = \frac{2}{3}}$
John	$\boxed{\frac{12}{24} = \frac{1}{2}}$	$\frac{24}{12} = \frac{2}{1}$

ACTIVITY 56 ANSWER KEY continued

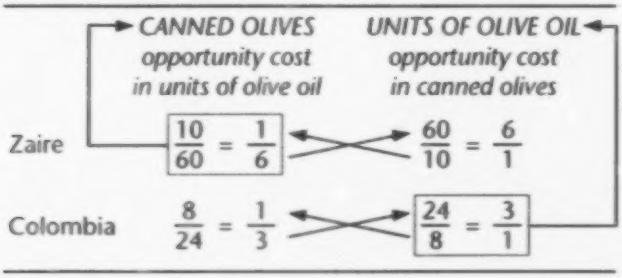
3. Days to produce one unit of each.
XYZ Corp.—8 cars
QKFX Corp.—12 planes
Input
XYZ Corp. has an absolute advantage in both. Input = under.


CARS
opportunity cost
in planes
PLANES
opportunity cost
in cars
XYZ Corp.
8/10 = 4/5
10/8 = 5/4
QKFX Corp.
15/12 = 5/4
12/15 = 4/5

4. Acres to produce 100 bushels.
India—9 corn
Afghanistan—2 rice
Input
Afghanistan has an absolute advantage in both. Input = under.


CORN
opportunity cost
in rice
RICE
opportunity cost
in corn
India
9/3 = 3/1
3/9 = 1/3
Afghanistan
8/2 = 4/1
2/8 = 1/4

5. To produce the following from one ton of olives.
Zaire—60 canned olives
Colombia—8 units of olive oil
output
Zaire has an absolute advantage in both. Output = over.


CANNED OLIVES
opportunity cost
in units of olive oil
UNITS OF OLIVE OIL
opportunity cost
in canned olives
Zaire
10/60 = 1/6
60/10 = 6/1
Colombia
8/24 = 1/3
24/8 = 3/1

ACTIVITY 57 **ANSWER KEY**

The Gains from International Trade

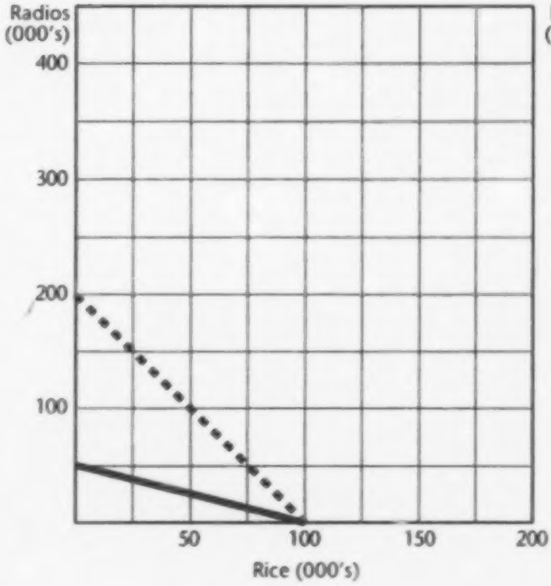
Use the data on the *Radios and Rice* graphs to illustrate the potential gains from trade using the theory of comparative advantage.

Indonesia today has the labor force, capital, natural resources, and technology to produce at most 50,000 radios *or* at most 100,000 pounds of rice *or* some combination in between.

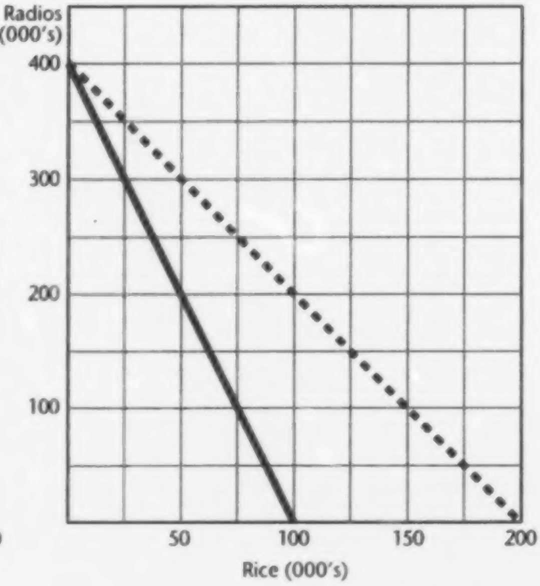
Japan, by contrast, can product at most 400,000 radios *or* 100,000 pounds of rice *or* some combination in between.

1. Draw a production possibilities curve (PPC) for each country.

Indonesia—Radios and Rice



Japan—Radios and Rice



ACTIVITY 57 ANSWER KEY continued

2. Calculate opportunity costs of production in the table *Indonesia and Japan—Radios and Rice.*

Indonesia and Japan—Radios and Rice

	Opportunity cost to produce	
	One pound more of rice	*One more radio*
Japan	**4 radios**	**¼ lb. rice**
Indonesia	**½ radio**	**2 lbs. rice**

3. Which nation has an absolute advantage in rice production? **Neither—both are the same**

4. Which nation has an absolute advantage in radio production? **Japan**

5. Which nation has a comparative advantage in rice production? **Indonesia**

6. Which nation has a comparative advantage in radio production? **Japan**

7. Suppose that trade takes place between the two countries and that the international barter price of one pound of rice now equals two radios. What is the implied barter price of radios? **1 radio = ½ lb. of rice**

8. Assuming that each country specializes completely in the product for which it has a comparative advantage, show with a dotted line on your *Radios and Rice* graphs the new consumption possibilities curve (CPC) for each country (with numbers on the axes). This is called a consumption possibilities curve because consumption at these levels can take place only after trade. How do you know consumers are better off in each country?
In Japan before trade, a pound of rice cost four radios. Now a pound of rice costs only two radios. In Indonesia, before trade a radio cost two pounds of rice. Now a radio costs only one-half pound of rice.

ACTIVITY 58 **ANSWER KEY**
Economic Efficiency and the Gains from Trade

1. a. *(The United States/~~Scotland~~)* has an absolute advantage in the production of oats.
   b. *(The United States/~~Scotland~~)* has an absolute advantage in the production of bagpipes.
   c. *(~~The United States~~/Scotland)* has a comparative advantage in the production of oats because **the opportunity cost of producing oats is less than for the United States.**
   d. *(The United States/~~Scotland~~)* has a comparative advantage in the production of bagpipes because **the opportunity cost of producing bagpipes is less than for Scotland.**
   e. The United States should specialize in *(~~oats~~/bagpipes)*.
   f. Scotland should specialize in *(oats/~~bagpipes~~)*.
   g. Why will both Scotland and the United States be better off if they specialize and trade? **More oats and bagpipes can be produced from the same resources through trade.**

2. a. *(The United States/~~Canada~~)* has an absolute advantage in the production of wheat.
   b. *(The United States/~~Canada~~)* has an absolute advantage in the production of cloth.
   c. *(The United States/~~Canada~~)* has a comparative advantage in the production of wheat because **the opportunity cost of producing wheat is less than for Canada.**
   d. *(~~The United States~~/Canada)* has a comparative advantage in the production of cloth because **the opportunity cost of producing cloth is less than for the U.S.**
   e. The United States should specialize in *(wheat/~~cloth~~)*.
   f. Canada should specialize in *(~~wheat~~/cloth)*.
   g. Why will both Canada and the United States be better off if they specialize and trade? **There will be more wheat and cloth produced from the same resources.**

3. a. *(~~The United States~~/Japan)* has an absolute advantage in the production of computers.
   b. *(~~The United States~~/Japan)* has an absolute advantage in the production of autos.
   c. *(~~The United States~~/Japan)* has a comparative advantage in the production of computers because **the opportunity cost is less than for the United States.**
   d. *(The United States/~~Japan~~)* has a comparative advantage in the production of autos because **the opportunity cost is less than for Japan.**
   e. The United States should specialize in *(~~computers~~/autos)*.
   f. Japan should specialize in *(computers/~~autos~~)*.
   g. Why will both Japan and the United States be better off if they specialize and trade? **There will be more autos and computers produced from the same resources.**

UNIT 6, LESSON 2

Evaluating the Arguments for Protectionism

Introduction and Description

Although there are clear benefits from trade, most nations have constructed obstacles to trade. Trade barriers like tariffs and quotas limit the potential gains from international specialization and exchange. They protect domestic sellers at the expense of domestic buyers. Trade restrictions reduce competition and efficiency. In this lesson, students analyze the arguments used by supporters of trade barriers and find most of these claims to be invalid.

Objectives

1. Describe examples of protectionist policies.
2. Analyze and evaluate the case for protectionism.
3. Use supply and demand curves to analyze the economic effects of tariffs and quotas.

Time Required

- Two and one-half class periods

Materials

1. Activity 59
2. Visuals 6.4, 6.5, and 6.6

Procedure

1. Describe some practices that are used to interfere with free trade. Point out that transaction costs limit the gains from trade. Transaction costs are the effort, time, and additional resources needed to search out, negotiate, and conclude an exchange. Many transaction costs involve physical barriers such as mountains, oceans, and rivers. Many of these costs—tariffs, quotas, subsidies, discriminatory standards, "voluntary restraints," and local-content requirements— are created by human beings.
2. Use Visual 6.4 to describe the economic effects of a tariff. Point out that tariffs increase prices and reduce the quantity of goods exchanged. This hurts foreign producers and domestic consumers but helps domestic producers.
3. Use Visual 6.5 to analyze the economic effects of a quota.
4. Before analyzing the arguments for protectionism, develop criteria for evaluating them. Alan Blinder has presented two important criteria:
    a. Do the policies make the economy more efficient?
    b. Do the policies improve equity or fairness in the economy? One definition of fairness might be "Do they redistribute income down the economic ladder rather than up the economic ladder?" Blinder suggests that barriers to trade do neither.
5. Use Visual 6.6 to evaluate the arguments for protectionism.
6. Have the students complete Activity 59. In this exercise, they use graphs to analyze the effects of tariffs, quotas, and subsidies.
7. Have the students draw their graphs on the board and then compare them to the answers. You could also make a visual of the answers.

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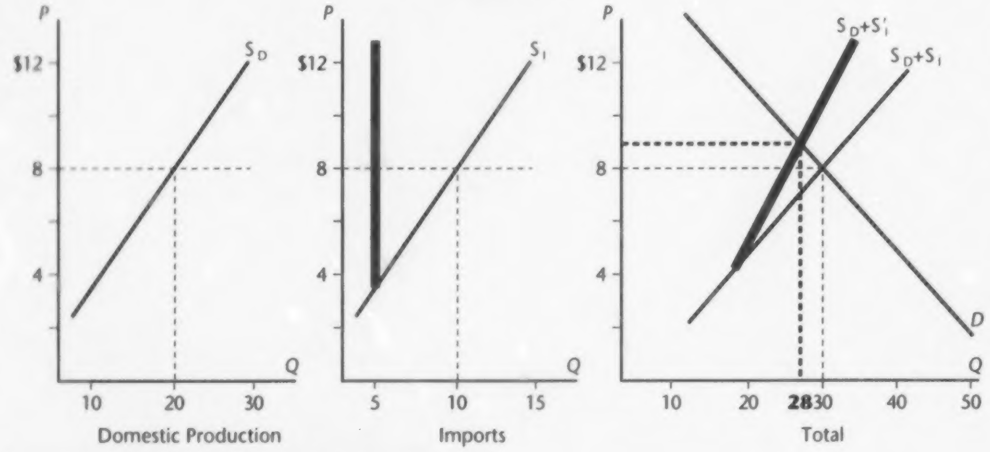
ACTIVITY 59 **ANSWER KEY**
Barriers to Trade

Quotas

As in *Exhibit 2,* modify the "free trade" situation in *Exhibit 3* to reflect the enactment of a quota limiting imports to only five units. Indicate the effect on price, domestic production, and imports. This quota means that no more than five units can be imported into the United States during this time period.

Exhibit 3

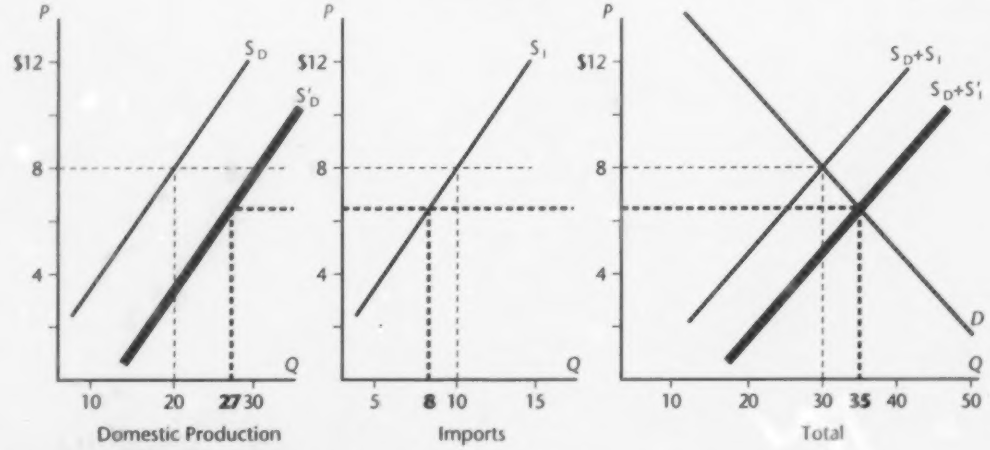


Answers: Domestic Production = 23
Imports = 5
Total Production = 28 instead of 30. Price has increased.

Subsidies

Modify the "free trade" situation in *Exhibit 4* to reflect the enactment of a subsidy to domestic producers. Indicate the effect on price, domestic production, and imports.

Exhibit 4



Answers: Domestic Production = 27
Imports = 8
Total Production = 35

UNIT 6, LESSON 3

What Is a Favorable Balance of Trade?

Introduction and Description

In this lesson, students study the mechanics and effects of changes in a nation's balance of trade and balance of payments. This lesson will explain how they are measured, what a deficit or surplus is, and why people feel so strongly about the information they convey. Students also learn to distinguish between a nation's current account and its capital account.

Objectives

1. Distinguish among the *balance of trade,* the *current account balance,* the *capital account balance,* and the *balance of payments.*
2. Analyze ways international transactions affect the current account and capital account.

Time Required

- One and one-half class periods

Materials

Activity 60

Procedure

1. Introduce the balance of payments problem to the students by showing sample headlines like "U.S. Balance of Payments Widens" or "Balance of Payments Deficit Largest in 10 Years."
2. Explain to the students that many myths and strong feeling surround the rather mundane, abstract statistical summary known as the U.S. balance of payments.
3. Give a brief lecture on the balance of trade and balance of payments.
4. Have the students read the first page of Activity 60. Answer any questions they may have.
5. Have the students complete the chart on the second page, read the rest of the Activity, and fill in the figures and answer the questions on the last page.
6. After discussing the answers, ask students questions such as these:
    a. Why do some people object to a current account deficit? (When imports are high, many people in industries that compete with these imports feel their jobs are in jeopardy.)
    b. What actions occur as a result of a deficit on our current account? (Borrowing by U.S. banks, the government, or investment by other countries in our economy.)
    c. How would a foreign aid grant to Zimbabwe be recorded—as a credit or a debit? (It uses up foreign currency and would be recorded as a debit, much like an import. Many times such grants require the receiving country to purchase some U.S. exports, and this second transaction would then be recorded as a credit.)

ACTIVITY 60 **ANSWER KEY**
Imbalance of Payments

Balance of Payments—
United States and Germany

	U.S.		Germany	
	Debit	Credit	Debit	Credit
1. United States sells $1 million of steel to German builder.		$1 m	$1 m	
2. Bank of America pays $5 million in interest to German depositors.	**$5 m**			**$5 m**
3. U.S. citizens spend $3 million on Mercedes automobiles built in Germany.	**$3 m**			**$3 m**
4. A U.S. firm receives a $2 million dividend on its investments in Germany.		**$2 m**	**$2 m**	
5. German tourists spend $3 million in the United States, while U.S. tourists spend $5 million in Germany.	**$5 m**	**$3 m**	**$3 m**	**$5 m**
6. A German firm pays $1 million to a U.S. shipping line for transporting a load of cars.		**$1 m**	**$1 m**	
7. U.S. exchange students spend $8 million for tuition at the university in Bonn, Germany.	**$8 m**			**$8 m**
8. The German government buys a $10 million missile from the U.S. Army to shore up its defenses		**$10 m**	**$10 m**	
TOTAL	**$21 m**	**$17 m**	**$17 m**	**$21 m**

ACTIVITY 60 ANSWER KEY continued

The table *Current and Capital Accounts* contains hypothetical international balance of payments data for the United States. All figures are in billions. Compute the missing figures and answer the questions that follow.

Current and Capital Accounts

Current account			
(1)	U.S. merchandise exports	$+150	
(2)	U.S. merchandise imports	–200	
(3)	Balance of trade		**–$50**
(4)	U.S. exports of services	+75	
(5)	U.S. imports of services	-60	
(6)	Balance on goods and services		**–$35**
(7)	Net investment income	+12	
(8)	Net transfers	–7	
(9)	Balance on current account		**–$30**
Capital account			
(10)	Capital inflows to the U.S.	+80	
(11)	Capital outflows from the U.S.	–55	
(12)	Balance on capital account		**+$25**
(13)	Current and capital account balance		**–$5**
(14)	Official reserves		**+$5**
			$ 0

The United States had a payment *(deficit/~~surplus~~)* of $ **5** .

1. Does the U.S. current account have a deficit or surplus? How do you know?
   ***A deficit:* The total of imports of goods and services exceeds the total of exports of goods and services.**

2. On balance, is the United States borrowing or lending money? How do you know?
   ***A net borrower:* The balance on capital account is positive, showing the United States as a net exporter of IOUs.**

3. Can this situation continue? *(Hint:* Think of who gains and who loses in any voluntary exchange between two parties.)
   ***Yes:* All voluntary exchanges are beneficial to both parties. The importers voluntarily purchased their goods and services, and the borrowers voluntarily exchanged IOUs for foreign currency.**

UNIT 6, LESSON 4

Exchange Rates and Their Effects on International Trade

Introduction and Description

This lesson first analyzes how the forces of supply and demand determine exchange rates among nations. When supply and demand determine exchange rates, they are called *flexible* or *floating exchange rates*. Few nations today have fixed exchange rates that are set by government. However, governments still try to manage exchange rates by having their central banks buy and sell currencies in order to affect the price of their currencies. This is called a *managed* or *dirty float*.

Changes in exchange rates affect imports, exports, and comparative labor costs. In addition, the effect of exchange rates on exports and imports affects the level of aggregate demand and, depending on the circumstances, helps or hinders the domestic economy in achieving full employment and price stability.

Objectives

1. Describe how exchange rates work, and convert currency values when given exchange rates.
2. Use supply and demand curves to analyze how events affect exchange rates.
3. Identify factors that influence the international exchange value of a nation's currency.
4. Understand the effects of currency appreciation and depreciation on international trade.
5. Analyze ways that monetary and fiscal policies affect exchange rates and ways that exchange rates affect imports, exports, inflation, and employment.

Time Required

- Two and one-half class periods

Materials

Activities 61, 62, and 63

Procedure

1. Announce that the class will be studying how trade is influenced by the different currencies used in countries around the world.
2. Ask how many students have traveled outside the United States and have them identify the currencies used in the different countries they have visited.
3. Have the students look over Activity 61. To familiarize students with exchange rate tables, ask questions such as these:
   a. How many dollars are needed to buy a British pound?
   b. How many francs are needed to buy a U.S. dollar?
4. Use a simple example to show how appreciation or depreciation of currency affects imports and exports.

   Year One: $1 = four francs
   Year Two: $1 = five francs

   a. Has the dollar appreciated or depreciated? (appreciated)
   b. Has the franc appreciated or depreciated? (depreciated)
   c. What is the price of one franc in Year One? ($.25)
   d. What is the price of one franc in Year Two? ($.20)
   e. If a good was made for $1 in Year One, what would it sell for in France? (four francs)
   f. If a good was made for $1 in Year Two, what would it sell for in France? (five francs)
   g. If the French made a good for four francs in Year One, what would it sell for in the United States? ($1)

LESSON 4 continued

   h. If the French made a good for four francs in Year Two, what would it sell for in the United States? ($.80)

   i. How would the depreciation of the French franc affect French exports and imports? (Exports would rise and imports would fall.)

5. Have the students complete Activity 61; discuss the answers.

6. Illustrate with supply and demand diagrams how changes in the supply of and demand for currencies change the price of the currency or the exchange rate.

7. Have the students complete Activity 62; discuss the answers.

8. Discuss ways monetary and fiscal policy changes affect exchange rates and how changes in exchange rates, in turn, affect a nation's interest rates, inflation rate, unemployment rate, and level of output.

9. Have the students complete Activity 63; discuss the answers.

10. Have the students draw a supply-and-demand diagram for each of the six examples in Activity 63.

ACTIVITY 61 **ANSWER KEY**

Using Foreign Exchange Rates

Part A.

1. Using the exchange rate tables, calculate the cost of the following products in U.S. dollars. To solve these problems, divide the cost in the foreign currency by the cost of the U.S. dollar in the foreign currency.

	May	July
a. A fake fur coat that costs C$500 in Toronto	**$416.67**	**$420.17**
b. A hotel room that costs 30,000 yen in Tokyo	**$226.04**	**$239.81**
c. A cup of cappuccino that costs three francs in Paris	**$.54**	**$.60**
d. A BMW that costs 65,000 marks in Germany	**$39,634.15**	**$43,918.92**
e. A skirt that costs 120 pesos in Mexico City	**$38.46**	**$34.88**
f. A coat that costs 65 pounds in London	**$116.07**	**$125.00**

Method of solution:
Cost in foreign currency ÷ cost of U.S. dollar in foreign currency

2. Using the exchange rate tables, compute the following for both May and July. How much would foreign tourists have to pay in their own currency for an American hotel room that cost $79? To solve these problems, divide the cost in U.S. dollars by the cost of the foreign currency in U.S. dollars.

	May	July
a. British pounds	**43.89**	**41.15**
b. Canadian dollars	**95.18**	**94.05**
c. French francs	**438.89**	**395.00**
d. German marks	**129.51**	**116.18**
e. Japanese yen	**10,394.74**	**9,875**
f. Mexican pesos	**246.88**	**271.41**

Method of solution:
Cost in U.S. dollars ÷ cost of foreign currency in U.S. dollars

3. Did the value of the dollar appreciate (strengthen) or depreciate (weaken) against the:

pound **$ depreciated** franc **$ depreciated** mark **$ depreciated**
yen **$ depreciated** Canadian dollar **$ depreciated** peso **$ appreciated**

ACTIVITY 61 ANSWER KEY continued

Part B.

Answer the following questions.

1. When the international value of the dollar decreased, what happened to the price of foreign goods for Americans?
   Foreign goods became more expensive for Americans.

2. When the international value of the dollar decreased, what happened to the price of American goods for people from other countries?
   American goods became cheaper for foreigners.

3. When the international value of the dollar increased, what happened to the price of foreign goods for Americans?
   Foreign goods became less expensive for Americans.

4. When the international value of the dollar increased, what happened to the price of American goods for people from other countries?
   American goods became more expensive for foreigners.

ACTIVITY 62 **ANSWER KEY**

Using Supply and Demand to Analyze Exchange Rates

1. In foreign exchange markets an increase in the demand for foreign exchange, say marks (DM), is also an increase in the supply of dollars. Use the *Market for $—Supply* and *Market for DM—Supply* diagrams to explain what would happen to the equilibrium exchange rate (currently $1 = DM3; DM1 = $.33 with 100 dollars being exchanged for 300 marks) if the U.S. demand for marks increased as shown in the *Market for DM* diagram. Draw in whatever new curves you need in the *Market for $* diagram, and answer these questions:

   a. The new equilibrium exchange rate is $1 = DM **2** (DM1 = $ **.50**).

   b. At this exchange rate **200** dollars will be exchanged for **400** marks.

2. At the new exchange rate, with other things constant:

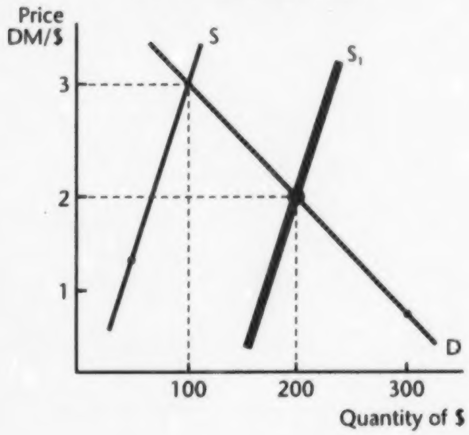
   a. Is the price of U.S. exports to Germany likely to increase or decrease? **decrease** Why? Explain. **A mark is now worth more dollars, so our goods will become cheaper to Germans.**

   b. Is the price of U.S. imports from Germany likely to increase or decrease? **increase** Why? Explain. **A dollar is now worth fewer marks, so German goods will become more expensive to Americans.**

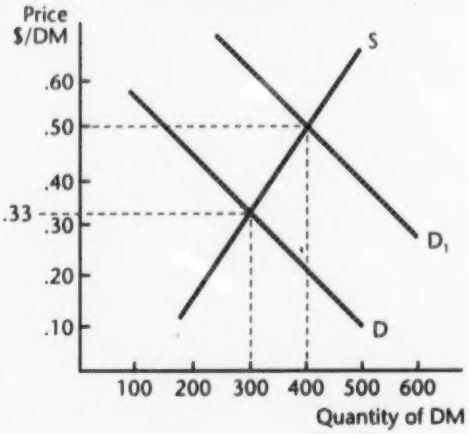
   c. Will U.S. workers become cheaper or more expensive for German manufacturers to hire? **cheaper** Why? Explain. **A mark is now worth more dollars, so it would cost a German less to hire a U.S. worker.**

   d. Will German workers become cheaper or more expensive for U.S. manufacturers to hire? **more expensive** Why? Explain. **A dollar is now worth fewer marks, so it would cost an American more to hire a German worker.**

Market for $—Supply
(German exchange rate)



Market for DM—Supply
(U.S. exchange rate)



ACTIVITY 62 ANSWER KEY continued

3. In foreign exchange markets an increase in the demand for dollars is also an increase in the supply of a foreign currency, say marks (DM). Use the diagrams *Market for $—Demand* and *Market for DM—Demand* to explain what would happen to the equilibrium exchange rate [currently ($1 = DM2) (DM1 = $.50) with 200 dollars being exchanged for 400 marks] if the German demand for dollars increased as shown in the *Market for $* diagram. Draw in whatever new curves you need in the *Market for DM* diagram, and answer the questions.

   a. The new equilibrium exchange rate is $1 = DM **3** (DM1 = $ **.33**).

   b. At this exchange rate **300** dollars will be exchanged for **900** marks.

4. At the new exchange rate, with other things constant:

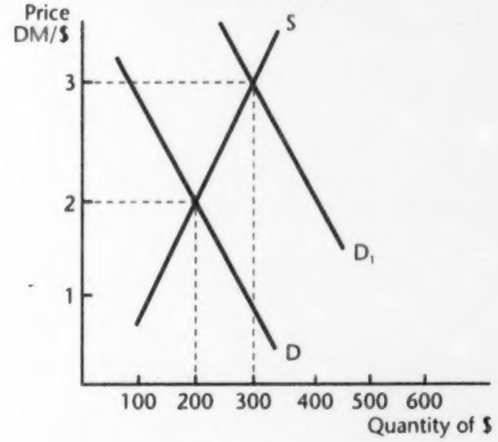
   a. Is the price of U.S. exports to Germany likely to increase or decrease? **increase** Why? Explain. **A mark is now worth fewer dollars, so our goods will become more expensive to Germans.**

   b. Is the price of U.S. imports from Germany likely to increase or decrease? **decrease** Why? Explain. **A dollar is now worth more marks, so German goods will become cheaper to Americans.**

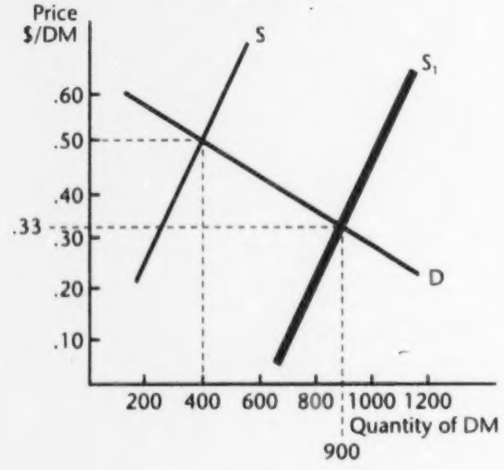
   c. Will U.S. workers become cheaper or more expensive for German manufacturers to hire? **more expensive** Why? Explain. **A mark is now worth fewer dollars, so it would cost a German more to hire a U.S. worker.**

   d. Will German workers become cheaper or more expensive for U.S. manufacturers to hire? **cheaper** Why? Explain. **A dollar is now worth more marks, so it would cost an American less to hire a German worker.**

Market for $—Demand
(German exchange rate)



Market for DM—Demand
(U.S. exchange rate)



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ACTIVITY 63 **ANSWER KEY**
The International Effects of Monetary and Fiscal Policies

1. An easy money policy is adopted by the U.S. Federal Reserve while Japan's interest rates are increasing.
   Expansionary policy to stimulate economy; interest rates decrease; foreign demand for dollars decreases because of the change in real interest rates; dollar depreciates; yen appreciates; U.S. exports are cheaper in Japan, and Japanese exports are more expensive in the United States; trade deficit decreases.

2. Relative interest rates in Japan increase because of increased government spending on defense.
   Funds flow into Japan to "purchase" Japanese investments due to its higher interest rates; increased demand for the yen—it appreciates; decreased demand for the dollar—it depreciates; weak dollar causes exports to increase and imports to decrease; contributes to a trade surplus (positive balance of trade).

3. The U.S. federal budget deficit increases.
   U.S. interest rates will increase due to crowding-out effect; Japanese investors enter U.S. market to take advantage of the higher rates, causing increased demand for dollars; dollar appreciates; yen depreciates; strong dollar will result in more imports for the United States and fewer exports, contributing to a negative balance of trade or trade deficit.

4. There is a rapid increase in the Japanese price level while the price level in the United States remains relatively constant.
   Japan increases its demand for lower-priced U.S. goods, increasing the demand for dollars; Americans buy cheaper domestic goods rather than Japanese goods, reducing the demand for yen and the supply of dollars; dollar appreciates; yen depreciates; U.S. exports increase; imports decrease; trade deficit decreases.

5. The Japanese economy is expanding while the U.S. economy is stagnating.
   Demand for U.S. products by the Japanese increases; Japan increases its imports of U.S. goods, and the demand for dollars increases; U.S. exports increase; imports decrease; trade deficit decreases; dollar appreciates; yen depreciates.

6. U.S. jeans become very fashionable among Japanese teenagers.
   Increase in Japanese demand for U.S. jeans; U.S. exports increase; trade deficit decreases; increase in Japanese demand for dollars; dollar appreciates; yen depreciates; imports will increase as a result of the currency change.

UNIT 6, LESSON 5

The International Way of Thinking

Introduction and Description

In this lesson, students will apply economic concepts to a variety of international situations. The lesson is designed to bring closure to the unit and to provide practice for the types of analysis and application questions on the AP Test.

Objectives

1. Apply international economic concepts to a variety of situations.
2. Analyze a variety of problems using international economic concepts.

Time Required

- One class period

Materials

Activity 64

Procedure

1. Have the students complete Activity 64 as homework or in groups.
2. Discuss the answers to Activity 64.

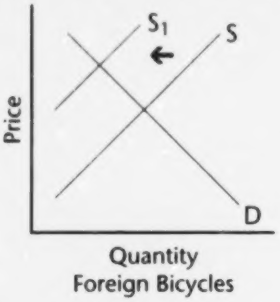
ACTIVITY 64 **ANSWER KEY**
The International Way of Thinking

1. True, false, or uncertain, and why? "Nations do not trade; people trade."
True. The decision to trade is made because two or more parties involved in the exchange expect to gain. When one or both of the trading partners believe they can no longer gain from trading, the exchanges will stop. It is important to understand that we all specialize and trade. By lowering transaction costs throughout the world, more of these mutually beneficial exchanges can take place.

2. Use one example from your own life when you specialized in doing something in which you had a comparative advantage and traded for something in which someone else had a comparative advantage.
There can be many answers to this. Students should show that the exchange is based on relative opportunity costs. Here is an example offered by Dale M. Sievert, an economics professor at Milwaukee Area Technical College*:

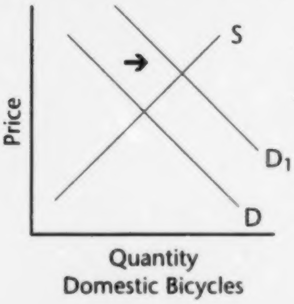
> **"Comparative advantage is commonly expressed in terms of relative advantage. I have found that students understand this concept more easily if you emphasize least disadvantage. For example, this approach can be used to describe a situation where a child who wants to help his father with gardening chores involving weeding, watering, and harvesting. Suppose the child is slower than the father in all tasks but most closely approximates his father in watering. The boy has a comparative advantage in watering and should do that chore, for he is least worst at watering."**

3. Assume that the United States has placed a high tariff on foreign bicycles.
   a. Use a supply and demand graph to show the effect of the tariff on the U.S. market for foreign-produced bicycles.



The tariff increases production costs which decreases supply. This increases price and decreases the quantity of foreign bicycles demanded.

   b. Use a supply and demand graph to show the effect of the tariff on the U.S. market for domestically produced bicycles.



Consumers substitute domestic bicycles for foreign bicycles. This increases demand and the quantity of bicycles supplied.

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*Ralph T. Byrns and Gerald Stone, editors, *Great Ideas for Teaching Economics*, Fifth Edition (New York: HarperCollins, 1992), p. 494.

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ACTIVITY 64 ANSWER KEY continued

c. What are the effects of the tariff on:
    (1) Foreign bicycle manufacturers? **Foreign bicycle manufacturers are hurt.**
    (2) Domestic bicycle manufacturers? **Domestic bicycle manufacturers are helped.**
    (3) U.S. consumers? **Consumers are hurt.**

4. The chart *Germany and France—Wine and Cheese* shows how much wine and cheese Germany and France can produce in a day.

Germany and France—Wine and Cheese

	Wine (liters)	*Cheese (kilos)*
Germany	25	30
France	50	40

a. Which country has an absolute advantage in wine production? Why?
France. Produces more in a day.

b. Which country has an absolute advantage in cheese production? Why?
France. Produces more in a day.

c. Which country has a comparative advantage in wine production? Why?
France. The opportunity cost of a bottle of wine in France is ⅘ of a kilo of cheese. In Germany it is 1 ⅕ kilo of cheese.

d. Which country has a comparative advantage in cheese production? Why?
Germany. The opportunity cost for a kilo of cheese is ⅚ of a bottle of wine. For France it is 1 ¼ bottles of wine.

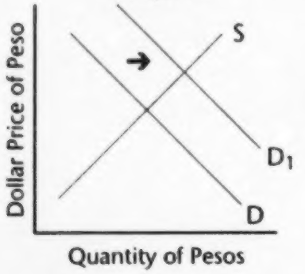
e. What should France import? What should France export?
France should import cheese and export wine.

f. What should Germany import? What should Germany export?
Germany should import wine and export cheese.

5. For each of the following situations, explain the effect of the event on *the value of the U.S. dollar* in relation to the Mexican peso. Draw a supply and demand graph to illustrate each situation.

a. Americans buy large quantities of Mexican tomatoes.

Graph A

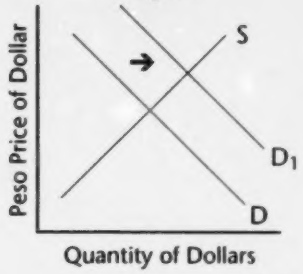


The peso will rise because Americans will have to buy pesos to buy Mexican tomatoes. The peso will appreciate. Therefore, the dollar will depreciate.

ACTIVITY 64 ANSWER KEY continued

b. Inflation in Mexico rises at a higher rate than in the United States.

Graph B



Mexicans will want to buy more American goods so the demand for the dollar will increase. The dollar will appreciate.

c. Americans invest heavily in Mexico because they feel the Mexican economy will be strong.
American investors will have to buy pesos to invest in Mexico. This will increase the demand for the peso. The peso will appreciate. Therefore, the dollar will depreciate. See Graph A.

d. Interest rates rise in the United States. and have become relatively higher compared to Mexican interest rates.
Mexicans will invest in the United States to take advantage of higher interest rates so the demand for the dollar will increase. The dollar will appreciate. See Graph B.

e. Mexico becomes a much more popular tourist destination for Americans.
American tourists will have to buy pesos. The demand for the peso will increase and the peso will appreciate and the dollar will depreciate. See Graph A.

6. Explain three effects of a new law that would forbid U.S. citizens and businesses from trading with any other country.
Any of the following:
a. Imports would decrease and exports would decrease (retaliation).
b. Prices would be higher.
c. The standard of living would be lower.
d. There would be far fewer goods and services and much less variety of goods and services.
e. Life would be nasty, brutish, and short.

7. Assume that the United States has large federal budget deficits that cause interest rates to rise.
a. What would be the effect of this on the international value of the dollar? Why? **Higher interest rates would attract foreign investment. The demand for the dollar would increase and the value of the dollar would rise (appreciate).**

ACTIVITY 64 ANSWER KEY continued

b. What would be the effect of this on the U.S. balance of trade? Why?
A stronger dollar would make U.S. goods more expensive in foreign countries and foreign goods less expensive in the United States. The trade balance would become more negative.

c. Would the budget deficit and higher interest rates tend to increase or decrease aggregate demand? Why? **The deficit would cause AD to increase. The fall in exports would cause AD to decrease.**

8. How could a nation have a negative balance of trade and still not have a deficit in its balance of payments?
The balance of trade considers exports and imports of goods only. Even if imports are greater than exports, there are also investment income, net transfers, capital inflows and outflows, and exports and imports of services. The balance of payments is a much broader measure than the balance of trade.

Answers to Sample Multiple-Choice Questions

1. c
2. a
3. c
4. a
5. d
6. e
7. b
8. b
9. c
10. a
11. c
12. e
13. c
14. b
15. c
16. c
17. d
18. d
19. d
20. d

Answers to Sample Short Essay Questions

1. a. A limit on foreign investment by U.S. firms would decrease the demand for foreign currencies, so the dollar would appreciate. An appreciated dollar would make U.S. exports more expensive and worsen the trade deficit.

   b. Selling dollars would make exports less expensive in foreign countries and imports more expensive in the United States. This would improve the balance-of-trade deficit.

   c. High tariffs would initially cause Americans to buy less foreign currency, increase the value of the dollar, and make U.S. exports more expensive in other countries. In addition, other countries might retaliate against the United States by increasing their tariffs on U.S. goods. The effect on the trade deficit is not clear because both imports and exports would fall.

2. *False.* High tariffs would make U.S. businesses less efficient, and we would obtain fewer goods and services from our scarce resources. Other countries might retaliate.

3. a. Liechtenstein. Produces more grapes.
   b. Liechtenstein. Opportunity cost is lower.
   c. Grapes. Liechtenstein a comparative advantage.
   d. Wool. Andorra a comparative advantage.

4. *Probably true.* The policy will cause high interest rates which will increase foreign investment in the United States. This will increase the demand for dollars and cause the dollar to appreciate. If the effect of the expansionary fiscal policy is greater, causing increased imports and decreased exports, then currency will fall.

5. Basically, the point distribution is three points for Part a and two for Part b.

Part a: (three points)

The major technological change increases productivity, which causes the aggregate supply curve to shift to the right, resulting in an increase in output and a decrease in price level. As a result, U.S. goods have become less expensive relative to foreign goods, thereby increasing the demand for U.S. goods → exports increase.

one point—Aggregate supply shift with explanation. No credit should be given for an assertion without a graph.
1/2 point—Increase in output.
1/2 point—Decrease in price level.
one point—Increase in exports with explanation that spells out relative prices.

Part b: (two points)

The increase in exports increases the demand for dollars, which increases the international value of the dollar.

one point—Increase in international value of the dollar (value of U.S. dollar appreciates).
one point—Explanation.

NOTE: A student may receive Part b points if it is consistent with the answer in Part a iii.

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ANSWERS TO SAMPLE SHORT ESSAY QUESTIONS continued

6. Basically, the point distribution is one point for Part a; two for Part b; and two for Part c.

   Part a: (one point)

   Prices increase due to cost-push effects. Short-run aggregate supply shifts leftward.

   one point—must make a coherent statement about why prices rise: costs rise.

   Part b: (two points)

   U.S. goods are relatively more expensive than foreign goods, therefore exports decline.

   one point—exports decline
   one point—explanation.

   Part c: (two points)

   Given the decline in exports, the demand for U.S. dollars decreases, resulting in a decline in the international value of the dollar. A parallel argument is that there is an increase in imports because foreign goods are now relatively cheaper for U.S. buyers, and the supply of U.S. dollars increases driving the international value of the dollar down.

   one point—decline in international value of the dollar
   one point—explanation.

   Alternative Part c:

   Inflation increases nominal interest rates (changing relative real interest rates) → capital inflows to the United States, which increases the international value of the dollar.

7. a. Exports will decrease because U.S. goods will be more expensive relative to foreign goods.

   b. Imports will increase because foreign goods will be less expensive relative to U.S. goods.

   c. The dollar will depreciate because Americans will be demanding more foreign currency while foreigners will be demanding less U.S. currency.

8. Although Canada has an absolute advantage in both products, Mexico has a comparative advantage in oil, and Canada has a comparative advantage in wheat. Mexico should export oil and import wheat. Canada should export wheat and import oil.

Answers to Sample Long Essay Questions

1. a. *Appreciate.* Visitors exchange their currency for Canadian currency.

   b. *Depreciate.* U.S. goods become relatively cheaper, stimulating imports by Canadians and reducing Canadian exports.

   c. *Depreciate.* Outflow of investment funds requires U.S. dollars.

   d. *Appreciate.* Investment funds shift from the United States to Canada.

   e. *Depreciate.* Canadian investment funds should be attracted to the United States.

   f. *Probably unchanged* until time of delivery, then appreciate because of increased exports. Consumer expectations could cause the demand for Canadian dollars to increase now.

2. The count-the-points approach: Part a, two points; Part b, three points; Part c, two points; Part d, two points.

Part a. (two points)
An aggregate demand/aggregate supply graph used to show the changes in tastes and preferences of foreigners shifts the aggregate demand curve to the right (upward), causing a rise in output and employment and an increase in the price level, would be sufficient for two points. A verbal explanation of what the graph represents without the graph would also be worth two points. If the answer, either verbally or graphically, has the change in foreign tastes and preferences shifting the AS curve as well, the answer is only worth one point. If the answer is only about shifting the AS curve, the answer gets no points.

If Keynesian analysis is used with no price discussion but an increase in AD, give it one point. If Keynesian analysis is used and then student goes on to the Phillips curve or some other correct price analysis to get price effects, give it two points.

Part b. (three points)
The basic points the answer should make are:
(i) The Fed's sale of bonds causes a decrease in the money supply, which increases the interest rates.
(ii) The increase in interest rates decreases the level of investment thereby decreasing AD → output declines and employment declines.
(iii) The decrease in AD → prices decline.

In allocating the three points, Part i receives one point. Parts ii and iii receive two points; discretion is permitted because Part ii requires more reasoning than does Part iii. If Part i states that the sale of bonds increases the money supply, but Parts ii and iii are consistent with this incorrect answer for Part i, then two points are given.

Part c. (two points)
The basic points the answer should make include:
(i) The increase in interest rates drives the international value of the dollar up as foreigners attempt to invest at the higher interest rates.
(ii) The increase in the international value of the dollar implies that the U.S. dollar can purchase more foreign currency thus the relative price of foreign

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ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

AP Question 2 continued

goods has declined → an increase in the demand for foreign products → imports increase.

(iii) The increase in the international value of the dollar implies that the foreign currency can purchase fewer U.S. dollars thus the relative price of U.S. goods has increased → a decrease in the demand for U.S. goods by foreigners → exports decrease.

In allocating the two points: (1) one point for Part i; (2) the effect on imports and exports must be consistent with the direction of the international value of the dollar to receive one point. BUT, student loses .5 point for not explaining why the interest rate changes the international value of the dollar.

If Part c is consistent with the interest rate direction in Part b (but shows interest rates decreasing in Part b), then student can receive full credit for Part c.

Part d.

The fundamental points the answer should make are:

(i) An increase in personal (corporate) taxes reduces disposable income (corporate income) thus reducing consumption (investment) and decreases AD. Thus, output and employment decrease.

(ii) The decrease in AD results in a price decrease. If the answer is on the Keynesian portion of the AS curve, explicitly stated, then prices will remain constant.

(iii) An increase in taxes holding government expenditures constant is a contractionary fiscal policy resulting in a decrease in interest rates. The decrease in interest rates is due to either a reduction in the government's demand for borrowed funds or a fall in the transactions demand for money given the decrease in income.

In allocating the two points: (i) is worth one point; (ii) and (iii) are each worth half a point.

3. The count-the-points approach: Part a, two points; Part b, five points; Part c, two points.

Part a. (two points)

An aggregate demand/aggregate supply graph used to show the natural disasters shifting the AS curve to the left, causing a fall in output and an increase in the price level, would be sufficient for two points. A verbal explanation of what the graph represents without the graph would also be worth two points. If the answer also shows the natural disasters shifting the AD curve as well as the AS curve, the answer is only worth one point. (A possibility: output is cut, people lose their jobs, thus demand decreases.)

If the answer is only about shifting the AD curve, the answer gets no points.

Part b. (five points)

The basic points the answer should make are:

(i) The increase in government spending causes an increase in demand.

(ii) The Fed's purchase of government bonds increases the money supply, which causes the interest rate to fall, which causes investment spending to rise (or some version of more lending and more spending).

ANSWERS TO SAMPLE LONG ESSAY QUESTIONS continued

AP Question 2 continued

(iii) The actions of (i) and (ii), both causing an increase in demand, will cause output, employment, and prices to rise (using an AD/AS diagram would be nice, but not essential); the interest rate will fall because of the Fed's purchases of government securities. (An answer might also recognize that the increases in output and prices would increase the demand for money and thus cause the interest rate to increase, but this is not an expected or necessary part of the answer.)

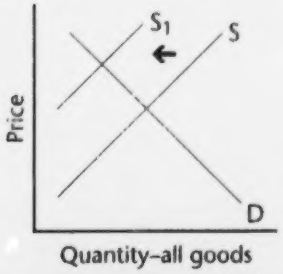
In allocating the five points for Part b, one point for (i) and two points each for (ii) and (iii) is reasonable.

Part c. (two points)

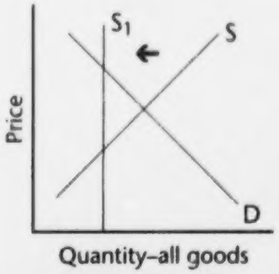
The question asks specifically how the change in prices and the change in output that occurred as a result of the actions taken in Part b will affect exports and imports. The increase in prices would make our goods less competitive and thus increase imports and decrease exports. The increased output would mean increased incomes, which would mean increased purchases of imported goods. It is also possible for the student to note that the lower interest rate will cause the price of the dollar to fall, which will make our goods more competitive. The really sophisticated student might also note that the higher prices, by decreasing exports and increasing imports, will create an excess supply of the dollar, thus causing a fall in the price of the dollar that would restore our competitiveness.

The upshot is that if the student addresses the effect of both prices and output on net exports, the answer is worth two points. If the student addresses one of these effects and also talks about one of the other possibilities mentioned above, he/she would also get two points. One point would be given for a correct discussion of one of the other possibilities alone. In other words, we are looking for ways to give the student points for this part.

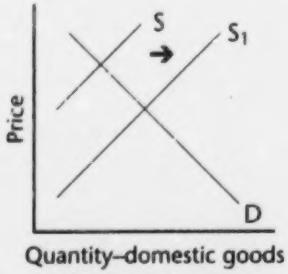
4. a. Domestic industry and agriculture will gain, and foreign industry and agriculture will lose. Most important, European consumers will lose.
   b. They want to keep employment higher and be less dependent on foreign producers.
   c. Most important, the standard of living will fall. Consumers will pay higher prices. The economy will be less efficient, and jobs will be lost in export industries. New jobs will not be created because more resources must be used to make existing goods.
   d. It would be less. If other nations cannot sell their goods to the EU, they will not have currency to buy EU goods. Other nations also might retaliate against the EU and raise their tariffs or impose quotas on EU goods.
   e.



Effects of a tariff



Effects of a quota



Effects of a subsidy

Visual 6.1

Absolute Advantage and Comparative Advantage

Absolute Advantage

One nation can produce more output with the same resources as the other.

Comparative Advantage

One nation can produce a good at a lower opportunity cost than the other.

Examples Of Comparative Advantage

Lawyer and secretary

Doctor and nurse

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Visual 6.2

Determining Comparative Advantage (Output Method)

The following chart illustrates the number of CDs and pounds of beef that can be produced in one hour.

	CDs	Beef
Japan	4	2
Canada	4	6

1. Which nation has an *absolute advantage* in producing CDs?
2. Which nation has an *absolute advantage* in producing beef?
3. Which has a *comparative advantage* in producing CDs?
4. Which has a *comparative advantage* in producing beef?
5. Should Japan specialize in CDs or beef?
6. Should Canada specialize in CDs or beef?

Visual 6.3

Determining Comparative Advantage (Input Method)

The following chart illustrates the number of hours it takes to produce one loaf of bread and one bushel of corn.

	Bread	Corn
United States	4	2
France	4	6

1. Which nation has an *absolute advantage* in producing bread?
2. Which nation has an *absolute advantage* in producing corn?
3. Which has a *comparative advantage* in producing bread?
4. Which has a *comparative advantage* in producing corn?
5. What will each nation gain if France trades a loaf of bread for a bushel of corn?

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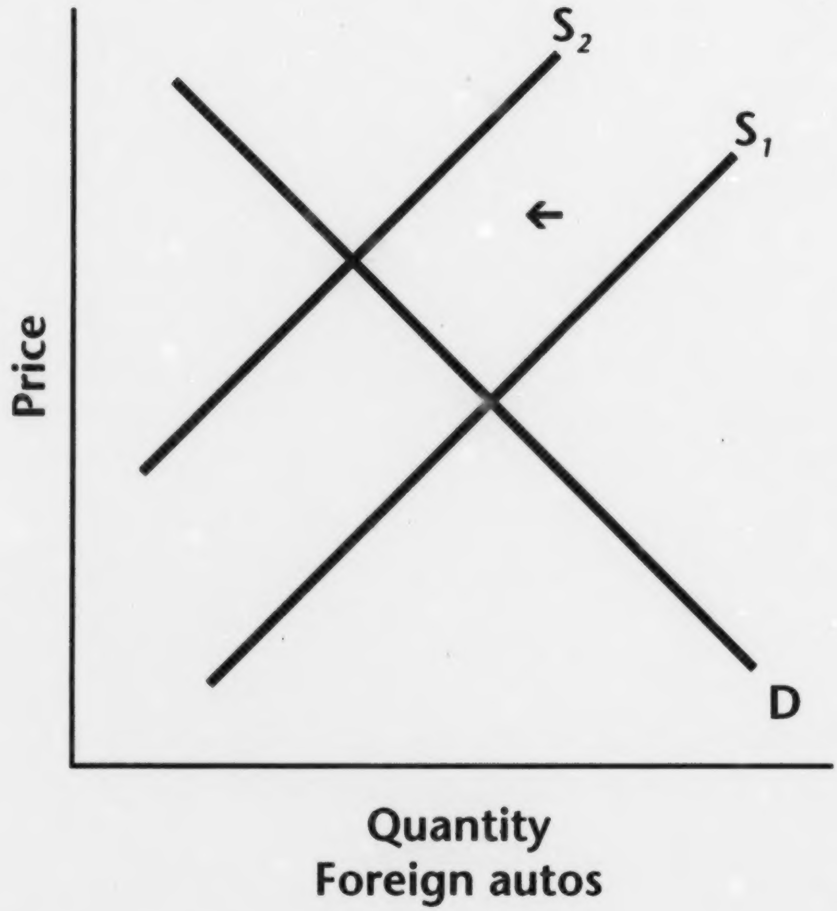
Visual 6.4

The Economic Effects of a Tariff



1. Why would a tariff decrease the supply of autos?
2. What effect would the tariff have on the price of autos and the quantity of autos purchased?

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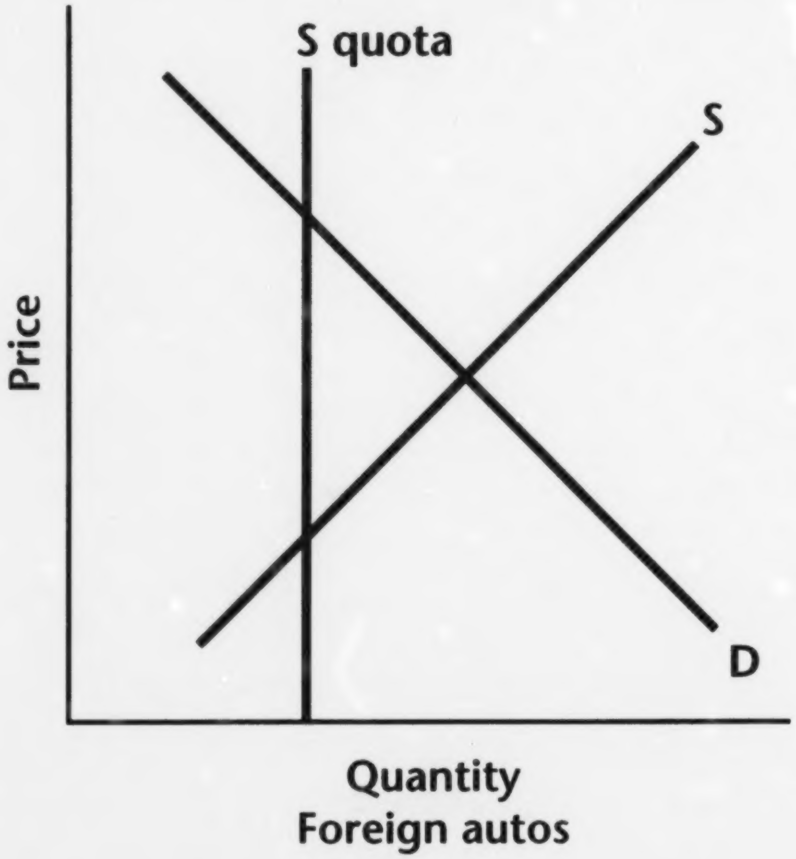
Visual 6.5

The Economic Effects of a Quota



1. Why is the supply curve with a quota vertical, or perfectly inelastic?
2. What effect would the quota have on the price of foreign autos and the quantity of foreign autos purchased?
3. What effect would the quota have on the price of domestic autos and the quantity of domestic autos purchased?

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Visual 6.6

Evaluating the Arguments for Protectionism

1. Have a self-sufficient military.

2. Increase domestic employment—preserve jobs.

3. Level the playing field—protect American workers from cheap foreign labor.

4. Help infant industries.

5. Diversify the economy.

6. Protect against dumping.

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